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NEW TESTAMENT AUTOGRAPHS.

A. 1. In the course of the first lecture, which I had the honor of delivering in this University, on the Textual Criticism of the New Testament, I pointed out that the material of the second and third Epistles of St. John was probably a sheet or series of sheets of papyrus ; and not only so, but that in the two documents mentioned, the sheet of paper was of a given size, capable of holding a given quantity of uncials. The first of these statements was based upon the allusion which the writer makes to paper, pen, and ink (*διὰ χαρτου καὶ μέλανος*, II John. 12 ; *διὰ μέλανος καὶ καλάμου*, III John. 13) ; while the second statement was an inference from the equality in the contents of the two Epistles, which in Westcott and Hort's edition of the New Testament occupy twenty-nine lines of type apiece, and from the evidence that in each case the writer had completely filled the sheet on which he was writing, since he complains of the insufficiency of his writing materials (*πολλὰ ἔχων ὑμῶν γράφειν, πολλὰ εἶχον γράψαι σοι*). From this point we are led to the enquiry as to the usual size of the sheets of paper employed in the New Testament documents, and the number employed in the autographs of the several books.

2. In order to make the enquiry carefully, we will first tabulate the number of columns and lines occupied by the uncial letters of the separate texts, as they are presented in the oldest known manuscripts. We begin, then, with the Vatican Codex, B. This manuscript is written in columns, three to the page, and each column contains 42 lines of uncial writing. Omitting the Epistle to the Hebrews, the latter part of which is in a later cursive hand, and the Apocalypse which is also supplied in cursive character,¹ we construct the following table :

¹ Scrivener adds the Pastoral Epistles (Introduction, p. 96), apparently following Cardinal Mai, but I can find no trace of them in the Roman edition. The Palaeographical Society, in the description accompanying their facsimile, follow Scrivener.

TABLE I.

	<i>Columns</i>	<i>Lines</i>	<i>Total Lines</i>
Matthew	127	9	5343
Mark	77	31	3265
Luke	136	41	5753
John	97	6	4080
Acts	130	3	5463
Romans	49	16	2074
I Corinthians	46	6	1938
II Corinthians	31	28	1330
Galatians	15	27	657
Ephesians	16	22	694
Philippians	11	0	462
Colossians	11	15	477
I Thessalonians	10	28	448
II Thessalonians	5	34	244
James	12	26	530
I Peter	12	30	534
II Peter	8	32	368
I John	13	27	573
II John	1	27	69
III John	1	27	69
Jude	3	27	153

The first thing that strikes us on examining this table is that the compositions do not end, as one might suppose, at different points of the page according to random distribution, but they show a preference for ending at particular points, and especially at the 27th line. Out of the 21 documents cited, five end on the 27th line of the page, two on the 28th and one on the 26th. This is very remarkable.

3. If the compositions were of arbitrary length, the probability that five out of the twenty-one should end on the same particular line is small indeed. Unless I am mistaken, it would be represented by the fraction

$$\frac{21 \cdot 20 \cdot 19 \cdot 18 \cdot 17}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5} \cdot \left(\frac{1}{42}\right)^5 \cdot \left(\frac{41}{42}\right)^{16}$$

which is evidently much less than $\frac{1}{1 \cdot 2 \cdot 3 \cdot 4 \cdot 5} \cdot \frac{1}{32}$ or $\frac{1}{3840}$. We may be sure then that the odds are at least four thousand to one against such a conjunction of endings being the work of *chance*.

It is evident that the eight compositions alluded to, viz. II Corinthians, Galatians, I Thessalonians, James, the three Epistles of John, and Jude, are each written on an integral number of sheets of a given size; and further, this sheet of given size must bear a peculiar relation both to the whole column of the Vatican Codex consisting of 42 lines, and to the fractional column of 27 lines; for, otherwise, it would not be possible for documents of different length, even though written on sheets of given size, to end at the same place on the Vatican page. If we allow a line for the subscription of those Epistles which end at the 27th line, we have to seek a submultiple of 28 and 42; and we at once see that 14 lines of the Vatican Codex bears some multiple proportion to the size of a page of the original writing, and in all probability, in the cases referred to, we may say that 14 lines of the Vatican Codex represents exactly the page of the autograph, the only submultiples of 14 being 7 and 2. This provides us with a unit upon which to base our calculations, which for convenience we will denominate a V-page.

4. We see, then, that of the Epistles especially referred to,

II Corinthians	= 95 V-pages exactly.
Galatians	= 47 V-pages, wanting one line.
I Thessalonians	= 32 V-pages exactly.
James	= 38 V-pages, wanting two lines.
I John	= 41 V-pages, wanting one line.
II John } each	= 5 V-pages, wanting one line.
III John }	
Jude	= 11 V-pages, wanting one line.

With regard to these conclusions, the single line left blank in the letter is probably left for subscription; in the case of the Epistle to the Galatians we have the additional explanation that there was a sentence in it written in large letters by the Apostle Paul's own hand, and when this sentence is copied there is a slight contraction in the copy as compared with the original.

With regard to St. James, we find two lines wanting; either, therefore, his handwriting is larger than ordinary, or we may assume that he actually left a somewhat larger blank space than was usual with the other writers, who evidently economized every inch of paper. The sheet of paper, too, is noticeably a small one; it is only capable of containing 14 lines of average length, about 17 letters each: this also is explicable by the supposition of economy, for the cost of a sheet of papyrus increases with the size of a sheet, but

in a much greater ratio than the sheet, on account of the difficulty of finding plants or reeds of a very great length and section. We can see, then, that the cheapest paper is used, and no space spared.

Now turn to the table again, and observing that our manuscript-unit is fourteen lines of the Vatican Codex, we see that in the autograph

Philippians = 33 V-pages exactly.

We come, then, to a group of three Epistles which run slightly over an exact number of pages ; thus :

Romans occupies	148 V-pages and two lines.
Colossians	33 V-pages and one line.
I Peter	38 V-pages and two lines.

With regard to the Epistle to the Romans, it is not inconceivable that in 148 pages the copy should have gained two lines on the autograph ; the study of the Epistle is, however, complicated by the existence of important various readings, and by the doubtful character of its concluding portion, which seems rather to be addressed to an Ephesian than a Roman community, and by the questionable authenticity of its doxologies. We content ourselves, for the present, by saying that the Epistle, as it stands in Codex B, probably represents 148 pages of the autograph.

With regard to the Epistle to the Colossians the question is more simple, as the document is shorter. Four lines of this Epistle, at least, are from the hand of Paul himself, and would therefore be in larger characters than usual ; this would make the original document longer than 33 V-pages and one line. Either, therefore, the greater part of a page was left blank, which is unlikely ; or Codex B has inserted words in the text, or the amanuensis of Paul (Tychicus, Onesimus?) must have written a smaller hand than was normal.

We leave the matter for the present undecided.

Similar remarks will apply to the 1st Epistle of Peter.

We annex the 2d Epistle of John, as we imagine it to have stood on the original sheets.

When we turn to the Gospels we have a much more difficult question to examine, on account of the multitude of various readings. We shall simply remark that the Gospel of Luke, in Codex B, is within a line of the end of a column, so that

Luke = 411 V-pages, wanting a single line.

In the Gospel of St. John, if we omit the last verse, we find ourselves at the end of a page, and

John = 291 V-pages exactly.

It will have been noticed that the number of V-pages occupied by the documents discussed is more often odd than even, which is more consistent with the hypothesis of papyrus sheets written on one side only, than with the supposition of a material capable of being written on both sides.¹

5. We shall now turn our attention to the Sinaitic Codex, which is written in columns, four to each page, and in lines, 48 to each column.² The difficulty in this case will arise from the fact that the lines of the text are not nearly so uniform as in the Codex Vaticanus, and in the first two Gospels in particular the text is broken up into paragraphs, and the recurrence of short lines, unless it be a genealogical feature of the successive MS, will prevent us from tracing the structure of the original documents. We proceed, however, to form our second table, constructed in the same way as the previous one, and containing a larger collection of books. The lines in this manuscript are shorter than in B, by several letters.

¹ The more delicate papyri are quite unsuited to the reception of writing on both sides: that species, in particular, which was held in the highest Roman estimation, and honored with the name of Augustus, was so fine as to be almost transparent, so that its extreme tenuity came to be regarded as a defect.

For a document to be written on both sides seems to be a mark of the poverty of the writer or the over-productiveness of his brain: thus we find in Juvenal I 5:

“Summa pleni jam margine libri
Scriptus et in tergo, necdum finitus Orestes.”

Lucian, Vit. Auct. 9, represents Diogenes as saying *ἡ πῆρα δέ σοι θέρμων ἔστω μεσση καὶ ὀπισθογραφῶν βιβλίῳ*.

Scripture students will call to mind an illustration of a similar kind in the Apocalypse, where the plenitude of coming judgments and tribulations is represented by a book or paper-roll written both outside and inside (Rev. V 1).

² This is not always true; in the Catholic epistles the scribe has frequently contented himself with a column of 47 lines. I do not know whether this peculiarity has ever been noted. Scrivener, in his collation of the Sinaitic MS, does not seem to allude to it. Our results, as given in the table, must be corrected for the aberration of the scribe, when we come to analyse the documents more closely.

TABLE II.

	<i>Columns</i>	<i>Lines</i>	<i>Total Lines</i>
Matthew	139	1	6672
Three letters only in the residual line.			
Mark	85	4	4084
Luke	149	24	7176
John	107	35	5171
Acts	146	10	7018
Romans	53	6	2550
I Corinthians	51	12	2460
II Corinthians	35	6	1686
Galatians	16	45	813
Ephesians	18	5	869
Philippians	12	9	585
Colossians	12	13	589
I Thessalonians	11	21	549
II Thessalonians	6	3	291
Hebrews	40	24	1944
I Timothy	13	40	664
II Timothy	10	3	483
Titus	5	37	277
Philemon	2	24	120
James	13	33	657
I Peter	14	9	681
II Peter	9	24	456
I John	15	12	732
II John	1	39	87
III John	1	39	87
Jude	4	6	198
Revelation	68	12	3276
Barnabas	53	18	2562

The first thing we notice is that the distribution of the concluding lines of the books is much more varied and irregular. The only thing that is remarkable is the recurrence of the multiples of twelve; three books end at the twelfth line, viz. I Corinthians, I John, Revelation; four end on the 24th line: Luke, Hebrews, Philemon, and II Peter; the Gospel of John ends on the 35th line, which may practically be counted as the 36th.¹ This, again, can hardly be

¹ It may be asked why, in discussing this table, we pay no attention to the repetition of the sixth line as an ending of three books, nor to the double recurrence of the number three. I have no theoretical objection to urge

accidental; we may assume that in the cases alluded to, with the exception of the 1st Epistle of John, which, on account of the irregular length of the columns, furnishes an accidental coincidence, there is a unit sheet of paper employed, capable of containing 12 lines of the Sinaitic Codex; we shall therefore have a new leaf of paper, (for reference to which we adopt the expression S-page, in order to distinguish it from the previous V-page), by means of which to measure our documents.

With regard to the comparative sizes of the two pages, it is evident at a glance that the S-page is smaller than the V-page, for it contains twelve lines where the other has fourteen, and has a smaller number of letters to the line.

6. We thus get the key to the method by which the text of the papyrus leaves was reduced into the shape in which we find it in the oldest manuscripts. Codex B selects the larger type of page, and arranges them nine on a page, or three in a side; while the Sinaitic Codex selects the smaller leaf, and arranges them sixteen on a page,

against either of these numbers, seeing that they are both submultiples of the whole column of 48 lines; but practically they are too small subdivisions, and their recurrence is accidental. The probability that out of 28 books, one number should recur in the line-endings three times (I do not say this time a particular number) is represented by

$$48 \cdot \frac{28 \cdot 27 \cdot 26}{1 \cdot 2 \cdot 3} \cdot \left(\frac{1}{48}\right)^3 \cdot \left(\frac{47}{48}\right)^{25}$$

whose value is nearly $\frac{2}{3}$.

It is almost certain, then, that such an event as the recurrence alluded to will be found in our table. Those who are interested in observing these recurrences may study the following table from the Codex Sinaiticus:

Tobit	ends on line	3	Jonah	ends on line	45
Judith	“ “	23	Nahum	“ “	15
Macc. I	“ “	38	Habakkuk	“ “	21
Macc. IV	“ “	37	Zephaniah	“ “	16
Isaiah	“ “	14	Haggai	“ “	3
Joel	“ “	19	Zachariah	“ “	38
Obadiah	“ “	28	Malachi	“ “	20

Here every ending is formed by random distribution (unless we except the book of Judith and the Maccabees), for the works referred to are translations, and have therefore no pattern; yet there is a double recurrence of the 3, and of the 38 with its submultiple 19. These are, of course, purely accidental. The recurrence would have to be more frequent before we should notice it, or look for any concealed cause at work to produce such a result.

four in a side. And it is this arrangement which Eusebius¹ describes when he says that the accurate MSS, prepared by order of Constantine, were written *τρισά καὶ τετρασά*; *i. e.* as we should say, in a square whose side is three, or in a square whose side is four. The V-pages, then, are arranged *τρισά*, and the S-pages *τετρασά*.

7. Now, examining our second table, we see at once that the Sinaitic Codex gives

Gospel of Matthew	=	556	S-pages, and three letters.
Gospel of Luke	=	598	S-pages.
I Corinthians	=	205	S-pages exactly.
Hebrews	=	162	“ “
Philemon	=	10	“ “
II Peter	=	38	“ “
Revelation	=	273	“ “

We may perhaps conjecture that Titus should be added to the list, as containing 23 S-pages and one line; while the Epistle to the Colossians is again doubtful, comprising 49 leaves and one line. We have thus deduced the type of almost all the Epistles, some of them with great exactness; and we observe that they fall into two groups, with the exception of some four or five Epistles, which either are not written so as to fill the paper, or are written on paper of a different size to the two sorts we have been considering, or on a different pattern.

8. When we turn to the Gospels we have a harder problem to solve, but I think we may say that if the two principal types of the early MSS are those indicated as *τρισά* and *τετρασά*, then it is far more likely that those types were found in the Gospels than that they were merely adopted from the Epistles. We may therefore expect to find some of the Gospels written *τρισά* and some *τετρασά*, or rather some on the V-page and some on the S-page. The question is, how shall we determine the type of the autograph for any particular Gospel? And here an important remark must be made. I am aware that every one of these results and suggestions is subject to a disturbing factor of the greatest moment, *viz.* the question of various readings in the text, and of accidental omissions or insertions of passages or lines in the great Codices. The disturbance will be most to be apprehended in the case of the longer compositions, and with regard to these all our results must be looked upon at first as

¹ Eusebius, Vit. Const. IV 37.

tentative. But in the smaller writings the various readings are generally so few and unimportant that the majority of our results may be regarded as unaffected by them. We will, however, examine the effect of these various readings in each of the separate books. It is the more important to do this carefully, because the Sinaitic and Vatican Codices are known to contain a number of apparent insertions and omissions and repetitions, which have been held up by a certain school as convincing proof of their unreliable character as witnesses to the text of the New Testament.

Dr. Dobbin gave in the Dublin University Magazine for November, 1859, a calculation of the omissions of Codex B in the different books of the New Testament, in which we find for

Matthew	330	omissions.	Jude	11	omissions.
Mark	365	"	Romans	106	"
Luke	439	"	I Cor.	146	"
John	357	"	II Cor.	74	"
Acts	384	"	Gal.	37	"
James	41	"	Eph.	53	"
I Peter	46	"	Philip.	21	"
II Peter	20	"	Coloss.	36	"
I John	16	"	I Thess.	21	"
II John	3	"	II Thess.	10	"
III John	2	"			

An appalling table, certainly, and one which, if we did not remember that the figures are the result of a collation with the Textus Receptus, and that the majority of them refer to wholly insignificant readings, would almost make us despair of finding in the Vatican or Sinaitic MSS any traces of the original style and size of the books of the New Testament. We will, however, discuss any important readings that may occur, and after having first carefully dissected the text of St. John, and examined the bearing of our investigation upon the stichometry of the New Testament, we will proceed to the Epistles, beginning with the smaller ones, and so working up to the longer Epistles, the Acts and the Gospels. And no result of the previous tentative examination is to be allowed to pass unchallenged or unverified.

9. We begin with the Gospel according to John. In the Vatican Codex this occupies 97 columns and six lines. In the Sinaitic Codex it occupies 107 columns and 35 lines. At first sight, therefore, it seems that the Gospel is written on the S-page, with only a

deficiency of one line from a total of 431 S-pages. But here comes in the question of the last verse of the Gospel, which Tischendorf observed to be written in the Sinaitic MSS by a different hand, and many scholia to different MSS affirm to be an addition. Removing this verse, eight lines of the Codex, the S-page is of course no longer apparent. But strange to say, when the verse is also removed from Codex B, in which it occupies six lines at the top of a page, we are left with a Gospel terminating at the end of a page, and in our notation occupying exactly 291 V-pages. The Gospel of John is, therefore, probably written on the V-page, and the apparent contradiction of this statement by the Sinaitic Codex may be due to the fact that in the type of MSS which that Codex has been following some one has utilized part of the blank space at the latter half of a column for the insertion of a sentence as to the number of books that might have been written. The addition must have been earlier than the age of vellum MSS, and may have arisen in the transcription of the Gospel of John from the larger-sized paper to the smaller, since it nearly fills the blank in a smaller sheet, and that sheet not the lowest in a Sinaitic column.

10. This conclusion with regard to the autograph of St. John leads to very important consequences with regard to the celebrated pericope of the woman taken in adultery. An examination of this passage shows that there are 908 letters either inserted in the text or dropped from it. Now the average number of letters to the line in St. John's Gospel in the Codex Vaticanus is 16.4, from whence we conclude that the passage in question is equivalent to about 56 lines of Codex B, *i. e.* to four V-pages exactly. Now it is obvious that four such pages could not by any possibility have been excised from a document in which the V-pages are arranged nine in a square. They must, therefore, have been lost from the original document before it came into the shape represented by Codex B. Their reinsertion has been characterized by great awkwardness in later manuscripts, and breaks the continuity of the narrative. They have been, in fact, restored to a place which they did not previously occupy.

Before going further we insert a reproduction of the four pages which we have reason to believe the lost passage to have occupied.

As a restoration of the text of B, it is not quite a successful effort. I have not, I find, done justice to the syllabic division followed by the scribe, who has a distinct custom in ending his lines and dividing his words, and prefers, if possible, to write a seven-syllabled line.

ΠΕΡΙ
ΜΟΙΧΑΛΙΔΟΣ
ΠΕΡΙΚΟΠΗ

καιεπορευθησ
στοσειστονο
ουτςδεεπορευ
οροστωνελαιδ
ρουδεπαλινπτ
ενετοειστοιε
ιπασολαοσρη
ροσαυτονκαικ
σεδιδασκενα
σαρουσινδεοιρ
ματεισκαιοις
αιοιγυναικαετ
χειακατειλημ
νκαιστησαντε

καὶ ἐπορεύθησαν ἐκ
στοσεῖστο νοῖκον αὐτ
οῦ ἰς δεῦ πορεύθη ἰστο
ορὸς τῶν ἐλαίων οὐθ
ροῦ δεπάλιν παρεγ
ενετο εἰς τοῖς ἐρον κα
ἰ πασὺν λαὸς ἡρχετο π
ρὸς αὐτὸν καὶ καθίσα
σε διδάσκειν αὐτοῦ
σα γοῦς ἰν δέ οἱ γραμ
ματεῖς καὶ οἱ φαρι
αῖοι γυναῖκα ἐπιμοι
χεῖα κατεῖλθεν μεν ἡ
ν καὶ ἰσθῆσαντες αὐτῇ

νεν μεσῶ λεγοῦς ἰν α
ὐτῷ διδάσκειν αὐτῇ
ἡ γυνὴ κατεῖλθεν π
αὶ ἐπαύτο φῶρ ῶμοι
εῖο μεν ἡν δέ τῶν ο
μῶν ἡν μῶς ἡ σεν
τεῖλα τὸ τὰς τοῖα αὐ
αὐτῇ θάξει ἰν σῶ
ν τῇ λεγεῖς τοῦ το
εὐλεγον πείραζο
τες αὐτὸν ἰν ἀεχῶ
ἰν κατῆγορεῖν αὐτ
οῦ οὐδε ἰς κατῶ κῦψ
στῶ δακτύλῳ κατ

ν μες ω λεγοϋς ι να
ω δι δα σκα λε α υ τη
γ νη κα τε ι λ η π τ
ε πα υ το φ ω ρ ω μο ι χ
ο με ν η εν δε τ ω νο
ω η μ ι ν μ ω υ σ η σ ε νε
ει λα το τα σ το ι α υ τ
ε λι θα ζει ν σ υ ο υ
τι λε γει σ το υ το δ
ε λε γ ο ν πει ρ α ζ ο ν
ε σα υ το ν ι να ε χ ω σ
ι κα τη γ ο ρ ει να υ τ
υ ο δε ι σ κα τ ω κ υ ψ α
τ ω δ α κ τ υ λ ω κα τε γ

ρα φ ε νε ι σ τ η ν η γ η ν ω
σ δε ε π τε με ν ο ν ε ρ ω
τ ω ν τε σα υ το να νε κ
υ ψ εν κα ι ει π τε να υ το
ι σ ο α να μα ρ τ η το σ υ
μ ω ν π ρ ω το σ λι θ ο νε
πα υ τη ν βα λε τ ω κα
ι πα λι ν κα τ ω κ υ ψ α σ
ε γρα φ ε νε ι σ τ η ν η γ η
νο ι δε α κο υ σ α ν τε σ
ε ζ η ρ χ ο ν το ε ι σ κα
θ ει σ α ρ ζ α με νο ι α π
ο τ ω ν π ρ ε σ β υ τε ρ ω ν
ε ω σ τ ω ν ε σ χ α τ ω ν κα

NEICTHNGHNΩ
TEMENONEPΩ
TESAYTONANEK
KAIEITTENAΥTO
NAMARTHOTOSY
PWTOSΛITHONE
HNBAΛETΩKA
INKATΩKYΨAC
ΦENEICTHNGH
EAKOYCANTEC
PXONTOEICKA
APZAMENOIATP
ITPPECBVTEPΩN
TΩNESCXATΩNKA

IKATELEIFΘHMONOCO
ICAKHNGYNNHENMECΩ
OYCAANAKYΨACDEO
ICAKIMHΔENABEAC
AMENOC TΛHNTHCΓ
YNAIKOC EITTENAΥ
THΓYNAITTOYEICIN
EKEINOIOIKATHΓOP
ICOY OYDEICCEKATE
KPINENHΔEEITTENOYΔ
EICKYPIEEITTENDEOIC
OYDEEPΩCEKATAK
PINΩTPPEY OYKAIMH
KETIAMARTANE

Moreover, some of the most capriciously concluded lines are meant to be syllabically divided, such as those which end with *ov* and leave the *κ* of the *ovκ* to be carried to the next line. This division occurs so frequently that it is evident that the scribe, in writing such words as *ovκ ἔστιν*, really regards the *κ* as a sort of prefix to the verb.

We may now proceed to determine the place where the celebrated pericope should be reinserted. Turning to the end of the fifth chapter, we find that it closes with the words: "There is one that accuseth you, even Moses on whom ye trust. For if ye had believed Moses, ye would have believed me; but if ye do not believe his writings, how can ye believe my words?" The scene then changes abruptly to Galilee: "After these things Jesus departed to the other side of the sea of Galilee from Tiberias." It is between these chapters that I would locate the pericope. The fifth chapter narrates how Jesus found in the temple the man whom he had healed at the pool of Bethesda; it describes the long subsequent discussion with the Pharisees, which must have taken nearly all day, after which they depart, each man to his own house, but Jesus to the Mount of Olives. Appropriately the Pharisees bring him next morning the woman for judgment, with the remark that "Moses in the law said . . . but what sayest thou?" Codex D, which gives the pericope in somewhat shorter form, is even more forcible, *τί δὲ νῦν λέγεις*; we conclude, then, that this is a far more likely place to locate the pericope than at the end of the seventh chapter.

This readjustment of the text at once removes many of the objections urged against its authenticity, and it also helps to fill up that unsightly chasm at the close of the fifth chapter. It is unnecessary to discuss in detail the objections which had been raised by critics to the passage as it originally stood, but we will quote a single one out of many difficulties urged, as given by Davidson in his Introduction to the New Testament, I 363. He says: "The greatest perplexity connected with the passage lies in the reason for bringing the case before Jesus. No adequate motive appears to induce the Scribes and Pharisees to employ this woman for the purpose of embarrassing the Redeemer, and thence extracting a ground of accusation against him. It is evident that they wished to entrap him; the narrative itself states that they tempted him in order to procure a tangible charge, but how they expected to do so by means of the adulteress is exceedingly obscure." I hope the obscurity disappears in the new arrangement of the text, and

that the passage is more harmoniously placed with regard to the context than previously.

Moreover there is this difficulty, that in the ordinary supposition these lost V-pages would begin four lines from the top of the page, and we should have to assume that Codex B had either added four lines to the autograph, or lost ten lines in the first seven chapters, before we could rectify the pages so as to reintroduce the lost columns of the papyrus. Neither of these suppositions seems likely, as the text of John in these chapters is remarkably good, and the text of B is more likely to be marked by omissions than insertions.

On our hypothesis they begin on the last line of the left-hand column of the page, and we have only to assume that a single line has been lost from Codex B in the first five chapters. We proceed to go in search of this lost line. The Gospel of John in B has comparatively few various readings in the shape of insertions or omissions. The majority of them consist of transpositions and changes of merely verbal importance. We proceed to tabulate those of them which affect our enquiry, from the principal editors and MSS.

		<i>Letters</i>	<i>Text. Rec.</i>	<i>Σ</i>	<i>B.</i>	<i>W. H.</i>	<i>T.</i>	<i>Tr.</i>
I 5.	τῶν ἀνθρώπων	11	+	+	—	+	+	+
I 13.	οὐδὲ ἐκ θελήματος ἀνδρὸς	21	+	+	—	+	+	+
I 27.	ὁς ἔμπροσθεν . . .	21	+	—	—	—	—	—
II 2.	A long variant in the Sinaitic, but very doubtful.							
III 13.	ὁ ὢν ἐν τῷ οὐρανῷ	13	+	+	—	—	+	+
III 31.	ἐπάνω πάντων ἐστίν	16	+	—	+	+	—	+
IV 9.	οὐ γὰρ συνχρῶνται . . .	34	+	—	+	+	+	+
IV 14.	οὐ μὴ διψίση . . .	40	+	+	+	+	+	+
V 12.	τὸν κράβαττόν σου	15	+	+	—	—	—	[+]
V 16.	καὶ ἐξίτουν . . .	25	+	—	—	—	—	—
V 45.	πρὸς τὸν πατέρα repeated	13	—	—	+	—	—	—

Reviewing the variants of the text of B thus far, we find four cases of probable omission, and two of insertion. If we allow that B is right in omitting τὸν κράβαττόν σου, the result is a balance of a line to be added, which suits our case exactly.

11. We must now examine the remainder of the Gospel in the same manner.

VI 11.	τοῖς μαθηταῖς . . .	23	+	—	—	—	—	—
VI 22.	ἐκεῖνο εἰς ὃ . . .	27	+	+	—	—	—	—
VII 30.	ἄγιον δεδομένον	14	+	—	—	—	—	[+]
VII 46.	ὡς οὗτος ὁ ἄνθρωπος	16	+	+	—	—	+	[+]

VIII 52.	B reads incorrectly, but the passage is of the same length as the ordinary reading.								
VIII 59.	διελθὼν . . .	34	+	—	—	—	—	—	—
IX 7.	B has dropped a line by ὁμοιοτέλευτον.								
IX 36.	ἀπεκρίθη . . .	23	+	—	+	—	[+]	+	+
X 13.	τὰ πρόβατα . . .	26	+	—	—	—	—	—	—
X 26.	καθὼς εἶπον ὑμῖν	14	+	—	—	—	—	—	—
XI 40.	οὗ ἦν ὁ τεθνηκώς	21	+	—	—	—	—	—	—
XIII 10.	εἰ μὴ τοὺς πόδας	13	+	—	+	[+]	—	+	
XIII 14.	B repeats two lines and a half.								
XIII 24.	B has a slightly longer reading.								
XIII 32.	εἰ ὁ θεὸς . . .	21	+	—	—	—	—	+	[+]
XIV 4.	καὶ οἶδατε	9	+	—	—	—	—	—	—
XIV 5.	δυνάμεθα	8	+	+	—	—	—	—	—
XVI 16.	ὅτι ἐπάγω . . .	21	+	—	—	—	—	—	—
XVII 15.	(κ)όσμου ἀλλὰ . . . omitted	35	+	+	—	+	+	+	
XVII 18.	κἀγὼ ἀπέστειλα repeated	31	—	—	+	—	—	—	—

The total result of our examination of this passage is that perhaps one or two lines might be added to the text of B, but the text has repeated more than five lines and dropped only three, so the total result is hardly affected.

It will be seen that we have made no allusion to the account of the troubling of the waters at Bethesda, which does not occupy a distinct number of V-pages.

But we must not altogether pass the passage by, for it enables us to see why the pericope *de adultera* came to be inserted in the wrong place. There is no doubt whatever that the gloss in question is very early, seeing that we find a striking reference to it in Tertullian, De Baptism. 9. Written on the V-pattern, the passage John V 3, 4 would occupy about 10 lines of manuscript. Bearing in mind that the passage to which the pericope *de adultera* has been wrongly restored is four lines from the beginning of a column, and adding the gloss on the Troubling of the Water to the fifth chapter, we have now moved the inserted pericope to the beginning of a V-page. Each of the three errors, viz. the omission of the pericope, its reinsertion, and the insertion of the gloss in chapter V, is therefore anterior to the age of vellum manuscripts, and we can even arrange the errors in their proper chronological order. Perhaps we ought to have added that in the same interval of time a balance of a single line was lost from the first five chapters of B.

The majority of the errors are of the V-type, that is, there are more V-lines than S-lines inserted or omitted. And this is just what we should expect, if the MSS were originally of the V-pattern; and we may lay down the following general principle: *A manuscript originally written on a certain pattern will generally show a majority of errors of the pattern on which it is written.* The advantage of this proposition is that it will help us to determine the original character of a MS, whether the MS occupy an exact number of pages of its pattern or not. We are now in the position to print the Gospel of John, approximately, from the original sheets.

No one can study the Gospel carefully without noticing the discontinuity of many of its sequences. The probability is that some passages are still lost from the 500 original sheets of the Gospel.

12. Now let us turn to the close of the Gospel and examine the endings of the 20th and 21st chapters: the similarity of the 30th verse of the 20th chapter to the last verse of the 21st chapter is unmistakable. The Gospel has apparently two endings. And here comes in the remarkable fact that Tertullian calls the 30th verse of the 20th chapter the close of the Gospel, although he quotes from the 21st chapter in at least two places: "Ipsa quoque clausula Evangelii propter quid consignat haec scripta, nisi, ut credatis, inquit Iesum Christum filium Dei?"¹ The proper place for the two closing verses of the 20th chapter is most likely at the end of the 21st chapter.

For the expression that there were "many other signs not recorded which Jesus wrought" implies (just as the expression "I had many things to write to you" in the II and III of John) an insufficiency of writing material; we are close to the end of the roll of paper.

In the next place, the restoration of the closing verses of the 20th chapter to the end of the 21st is strikingly harmonious with the introduction of the Gospel, to which it returns as a keynote, and with the 24th verse of the 21st chapter which precedes it.

And thirdly there is room for a single conjectural emendation which adds vividness to the narrative. In XXI 30, after ἐνώπιον τῶν μαθητῶν, many important MSS, especially those which exhibit a Western text, insert αὐτοῦ. It is a lawful suggestion that the original reading was simply ἐνώπιον αὐτοῦ, which was altered as soon as the verse had become severed from its proper connection.

¹ Tertullian, Adv. Praxeam, 25.

The Gospel now closes as follows :

οὗτός ἐστιν ὁ μαθητὴς ὁ μαρτυρῶν περὶ τούτων
καὶ ὁ γράψας ταῦτα, καὶ οἶδαμεν ὅτι ἀληθὴς
αὐτοῦ ἡ μαρτυρία ἐστίν * πολλὰ μὲν οὖν καὶ ἄλλα
σημεῖα ἐποίησεν ὁ Ἰησοῦς ἐνώπιον αὐτοῦ ἃ οὐκ
ἔστιν γεγραμμένα ἐν τῷ βιβλίῳ τούτῳ * ταῦτα δὲ
γέγραπται ἵνα πιστεῦντε ὅτι Ἰησοῦς ἐστιν ὁ Χριστὸς
ὁ υἱὸς τοῦ Θεοῦ καὶ ἵνα πιστεύοντες ζωῇ
ἔχητε ἐν τῷ ὀνόματι αὐτοῦ.

13. We now proceed to state the further results at which we have arrived for the several books of the New Testament, postponing the critical details to a subsequent page. It will be convenient to tabulate, as far as possible, the whole of the results in a form suitable to a critical comparison.

TABLE III.

	SINAITIC.			VATICAN.			S or V.	Probable number of S-pages.	Probable number of V-pages.	Probable number of sheets bought.	Ratio of V-line to S-line, uncorrected for omissions, etc.	Average Letters to the line.	
	Col.	Line	Total	Col.	Line	Total						S	V
Matthew	139	1	6672	127	9	5343					1.249	13.24	16.8
Mark	85	4	4084	77	31	3265					1.250	13.04	16.4
Luke	149	24	7176	136	41	5753	S	600		600	1.247	13.6	16.5
John	107	35	5171	97	6	4080	V		295	300	1.267	13.3	16.7
Acts	146	10	7018	130	3	5463	S	578		600	1.284		
I Thess.	11	21	549	10	28	448	SV	46	32	50	1.225		
II Thess.	6	3	291	5	34	244	S	24			1.192		
I Corinthians	51	12	2460	46	6	1938	S	205			1.269		
II Corinthians	35	6	1686	31	28	1330	V		95	100	1.267		
Galatians	16	45	813	15	27	657	V		47	50	1.236		
Romans	53	6	2550	49	16	2074	V		147	150	1.229		
Ephesians	18	5	869	16	22	694	S	73			1.252		
Philippians	12	9	585	11	0	462	SV	49	33	50	1.266		
Colossians	12	13	589	11	15	477	S	49		50	1.232		
Philemon	2	24	120				S	10					
I Tim.	13	40	664										
II Tim.	10	3	483										
Titus	5	37	277										
Hebrews	40	24	1944										
James	13	33	657	12	26	530	V		38	40	1.237	17.2	
I Peter	14	9	681	12	30	534	S	57		60	1.275		
II Peter	9	24	456	8	32	368	S	38		40	1.239		
I John	15	12	732	13	27	573	V		41		1.277	16.4	
II John	1	39	87	1	27	69	V		5		1.260	16.5	
III John	1	39	87	1	27	69	V		5		1.260	15.2	
Jude	4	6	198	3	27	153	V		11		1.294		
Revelation	68	12	3276				S ?	273					

We have, on the basis of the previous investigation, constructed a column in the table showing the ratio of the V-line to the S-line for different books.

If a book contain m lines in the Sinaitic and n in the Vatican Codex, we have, other things being equal, $mS = nV$, or

$$\frac{V}{S} = \frac{m}{n}$$

where V and S represent the V- and S-line respectively. But this ratio must be corrected for omissions and insertions; if, for example, B omits q lines of the original, the ratio ought to be $\frac{m}{n+q}$, or it is diminished in the ratio $n:n+q$, or giving p either sign, and reserving the $+$ sign for omissions, the ratio is altered by the fraction $\frac{n}{n \pm q}$. Similarly, if the Sinaitic Codex omits p lines, the ratio is altered by $\frac{m \pm p}{m}$. Change in the style of a writer will also affect

the number of lines, etc., but at any rate we can see that, as a general rule, *books written in the same style and by the same author will be similarly affected by the processes of transcription.*

Referring to our table we have ratios as follows:

John 1.267	I John 1.277
II John 1.260	III John 1.260

results so nearly coincident that they suggest the same hand in the original documents.

But this remark must not be unduly pressed; for, strictly speaking, if any book is written out on the same two given patterns, the ratio of the lines is fixed, for V and S are fixed, and $\frac{m}{n} = \frac{V}{S}$.

Hence, when the text has been corrected, the column of ratios ought to be the same for all books. And the normal value of the ratio, if we allow 36 letters to the V-type for 28 to the S-type, is $\frac{9}{7}$, or 1.285. The first use of this table is to show, or rather suggest, omissions or insertions in a codex. When these are corrected for, there remains a residual effect upon the ratio produced by the variation in the hand of a scribe, induced by his copy being somewhat different from his normal style. And this residual effect may perhaps help us to classify the scribes of the different books.

We have grouped the Pauline Epistles in chronological order, and it is interesting to observe that those Epistles written at the

same time show traces of being written in the same manner. Thus Galatians and Romans are both written on the V-page; between them they occupy 200 sheets of paper.

Ephesians, Philippians, Colossians, and Philemon are all written on the S-page (unless we must except Philippians). And the four Epistles together occupy 200 sheets of paper. The three pastoral Epistles show traces of being written in the same style, but we have not been able to identify it. The two Epistles of Peter agree in this, that they are both written on the S-page.

B. I. The resolution of the books of the New Testament into two main groups, characterized as the S-type and V-type respectively, has an important bearing upon the stichometry of the New Testament.

Professor Gildersleeve has drawn my attention to the analysis by which M. Ch. Graux showed in the *Revue de Philologie* for April, 1878, that the *στίχος*, both in sacred and profane writers, represented not a verse, nor a clause, nor sentence, *but a fixed quantity of writing*. Evidence is offered in this article that copyists were paid at a fixed legal rate per 100 lines. Such a law would have been vain and illusory if early and constant tradition had not established what was to be understood by the length of the line. M. Graux estimates as nearly as possible the number of letters contained in a given work of some sacred or profane author, and divides this number by the number of *στίχοι* which the manuscript of the work declares it to contain. The results at which he arrives are very remarkable, being almost all of them included between 35 and 38 letters to the *στίχος*. From 50 consecutive lines in the *Iliad* opened at random, he deduces that the average Homeric line contains 37.7 letters.

The significance of these results can hardly be mistaken: they imply that the *στίχος* is equivalent to the Homeric line. Now if we apply this result of M. Graux to the case of the Codex Vaticanus, it is almost impossible to resist the conclusion that two lines of the Codex Vaticanus are meant to represent the same quantity; we have found by selecting 25 lines at random in Codex B that the average for a single line is nearly 17 letters; two such lines come very near to the average obtained by M. Graux. But if this be correct, what shall we say of the much shorter lines of the Sinaitic Codex? We are inclined to believe that they represent the half of an iambic line. Taking the average of 25 lines from

the Medea of Euripides, we have 29.96 letters; but we have already found for the Codex Sinaiticus the number of letters to be nearly 14, which is not far from the half of the iambic line. These must therefore be two of the principal types of writing employed both before and after the time of the composition of the books of the New Testament: and these are the two principal types employed in the New Testament. The origin of what we have called the S-page and V-page respectively is therefore to be found in the iambic and hexameter lines.

These results admit of a very simple test. In the Epistle of James, I 17, we have an almost perfect hexameter:

πᾶσα δόσις ἀγαθὴ καὶ πᾶν δῶρημα τέλειον.

Now this occupies exactly two lines in Codex B, as the following transcript will show:

ΠΑΣΑΔΟ
ΣΙΣΑΓΑΘΗΚΑΙΠΑΝΔΩ
ΡΗΜΑΤΕΛΕΙΟΝΑΝΩΘΕΝ

In the same way the iambic which St. Paul quotes in I Cor. XV 34 from Menander:

φθείρουσιν ἥβη χρηστὰ ὁμυλίας κακαί,

is exactly two lines in the Sinaitic Codex.

It will be noticed that our lines, as a general rule, fall a little short of the average hexameter and iambic. The reason for this lies in the fact that a scribe paid at so much a hundred lines, when copying some other work than Homer, selected a short line of Homer for his pattern. By this means the conventional *στίχος* is a little smaller. These *στίχοι* must not be confounded with the divisions of the text made by Euthalius, an Alexandrian deacon, in the fifth century, which does not proceed by letters, but apparently by words and sentences.

2. The allusion which we have made to the existence of an iambic *στίχος* explains a difficulty in Josephus. At the close of the Jewish Antiquities the writer says, 'Ἐπὶ τούτοις τε καταπύσω τὴν ἀρχαιολογίαν, βίβλοις μὲν εἴκοσι περιειλημμένην, ἐξ δὲ μυριάσι στίχων. M. Graux remarks on this that if we were to take the assertion of Josephus literally, that his work contained 60,000 *στίχοι*, we should find for the value of the *στίχος* the inadmissible quantity 28 or 29 letters. He therefore proceeds to explain away the statement of Josephus, as being a rough expansion of the assertion that each of the twenty books of the Antiquities contained 2000 to 3000 *στίχοι*.

Birt, on the other hand (Buchwesen, p. 204), attempts to evade the difficulty by changing ἐξ δὲ μυριάσι into εἰ δὲ μυριάσι, by means of which he deduces the Josephus-line to be 34.2 letters.

We have only to assume, however, that Josephus employs the iambic verse as his model, and the result arrived at by M. Graux needs no further explanation.

A singular corroboration of this assumption will be found by examining the lengths of some of Josephus' own letters as given by himself. I will here only briefly allude to one result out of many. If we examine the six letters contained in the life of Josephus, we shall find that the

Letter of Jonathan to Josephus (Vita 44) contains 26 S-lines.

"	Josephus to Jonathan (Vita 44)	"	33	"
"	Jonathan to Josephus (Vita 45)	"	12	"
"	Josephus to Jonathan (Vita 45)	"	12	"
"	Agrippa to Josephus (Vita 65)	"	12	"
"	Agrippa to Josephus (Vita 65)	"	12	"

The recurrence of the number 12 is very remarkable, and four out of the six letters reduce at once to the S-pattern, while one of the remaining letters is only two lines in excess.

A similar remark will possibly apply to one or two other results of M. Graux. In calculating the value of the *στίχος* for the Epistles of Clement, as given in Gebhardt's editio minor, by means of the data supplied by Nicephorus and Anastasius, he comes to the conclusion that the *στίχος* is 29 letters to which he affixes the mark of doubtfulness. We need only assume that the writing is based on the iambic *στίχος* and all is clear. M. Graux appears to accept as the mean result for the *στίχος* based on the Homeric line, a number of letters between 34 and 38 as limits, and with 36 for the normal type. If we allow the same latitude of limits, say take the normal iambic *στίχος* at 28 or 29 letters and allow limits 27 to 31 letters, we can at once explain several other results which were rather rejected by M. Graux as inconsistent with his theory, or were marked by him with a query.

3. But now let us return for a moment to M. Graux's estimate of 36 letters to the *στίχος*. The following passage from Eustathius, Bishop of Antioch in the fourth century, will perhaps be a good test as far as the New Testament is concerned. In his treatise *De Engastrimutho*¹ we read as follows: ἦραν οὖν λίθους ἵνα βάλωσιν ἐπ'

¹ Migne, Patol. XVIII 657.

αὐτὸν* ὡς δὲ ταῦτα προῦγραψεν ἐν τῷ μεταξύ πέντε πον καὶ τριάκοντα πρὸς τοῖς ἑκατὸν στίχοις ὑπερβὰς ἐπιφέρει προσθεῖς* ἐβάστασαν οὖν οἱ Ἰουδαῖοι λίθους ἵνα λιθάσωσιν αὐτὸν, that is to say, between two given passages of the Gospel of John, VIII 59 and X 30, Eustathius reckons about 135 στίχοι. Now if we count these intervening lines in Codex B we have 326 lines, which is more than twice 135, and in the Sinaitic Codex the passage occupies 414 lines. If, however, we count the actual letters in the passage, we find from the Sinaitic Codex 5375 letters, which when divided by 135 gives us 39.9 letters to the στίχος, a result somewhat too large, but still confirmatory of M. Graux's conclusion. It will be noticed that Eustathius is approximate.¹ Probably he mistook 135 for 145. The number of intervening στίχοι is really nearer to 150, and at 36 letters to the στίχος is almost exactly 149. From this last result it will be easy to express any book in the New Testament in στίχοι, for we may say approximately:

$$\begin{aligned} 326 \text{ Vatican lines} &= 414 \text{ Sinaitic lines} \\ &= 149 \text{ στίχοι of } 36 \text{ letters each.} \end{aligned}$$

The calculations are given in a subsequent table, and are compared with estimates derived from various codices.

4. The same supposition of a normal iambic στίχος explains the statement of Dionysius of Halicarnassus (on the superiority of the elocution of Demosthenes) that Demosthenes' works contain 50,000 or 60,000 στίχοι. M. Graux dismisses this statement with the words, 'on voit que Denys ne tenait pas à l'exactitude absolue des chiffres.' But even if we admit the estimate to be a rough one, we have a right to assume that the accurate number of στίχοι should fall *between* the assigned limits. That it does not so fall is pointed out by W. Christ in his Atticusaufgabe des Demosthenes, in which he calculates from the stichometric indications of certain manuscripts of Demosthenes that the whole number of στίχοι is not much above 42,000. The conclusion drawn by the writer (as given by M. Weil in the Revue Critique for Nov. 27, 1882) is that the exemplar on which the reckoning is based is one of shorter lines than is usual.

But the question immediately arises whether this case is not explicable by the hypothesis of the iambic line: increasing the

¹ This supposition is unnecessary. Very interesting cases can be given, especially from Galen, of hexameter lines measured at over 40 letters.

estimated 42,000 *στίχοι* in the proportion of 7 to 9, which we have seen to be the ratio of the normal tragic verse to the heroic, we have 54,000 *στίχοι*, which falls nearly half-way between the limits suggested by Dionysius of Halicarnassus. We may study these stichometric indications in the important Munich MS of Demosthenes, known as Bavaricus, where the *στίχοι* are marked by hundreds on the margin by the letters A, B, etc. They are given by Reiske in his edition of Demosthenes, and we have only to take the average *στίχος* from the space intervening between two successive letters.

It is necessary to show that these stichometric marks do actually refer to a line measured by the longer model. As I have not been able to obtain a copy of M. Christ's work, I have calculated the *στίχος* from the data given by Reiske, where the marks are given at p. xcii of the preface, with the lines to which they refer. It would be difficult to mark the stichometric intervals even if the series were perfect (which is not the case by any means), for, first, we cannot tell to what part of Reiske's line the indication applies, neither can we be sure that Reiske knew to what part of the line of the MS they applied. Thus there is a chance of error four times repeated, twice for the beginning of the stichometric interval, and twice for its close.

As an example, let us take the oration against Timöcrates. Reiske gives the following references to his pages and lines for the stichometric marks: 703, 17 A; 705, 17 B; 711, pen. Γ; 715, 10 Δ; 722, 14 Z; 725, 19 H; 728, 22 Θ; 731, 26 I; 738, 18 Δ; 741, 26 M; 744, 1 N; 746, 18 Z; 752, 8 O; 755, 13 Π; 761, 22 Σ; 764, 25 T. Here the second Δ should be Λ, and the second Z should be Ζ. From these, by means of Reiske's 29-lined page, we at once get intervals 58, 185, 98, 207, 92, 90, 91, 193, 95, 62, 75, 184, 92, 183, 90 lines. Of these fifteen results, the first, fourth, tenth, and eleventh are clearly not a multiple of the stichometric interval, either because Reiske's text is not the text to which the marks can properly apply, or because the marks are wrongly placed. From the remaining results we get the value of the interval, the second being clearly the double of such an interval, and the mean of the results is 92.4 Reiske-lines. But the average Reiske-line is 40.2 letters; the stichometric interval is therefore 3714.48 letters, from which it at once appears that the marks are meant to represent the successive hundreds of hexameter lines, each line being 37 letters. This establishes the nature of the stichometry of Bavaricus.

5. It is from the edict of Diocletian, *de pretiis venalium*, that M. Graux derived the statement as to the pay of the scribe by the given amount of writing. We proceed to examine the edict more closely. It is given in many exemplars, more or less complete, in the *Corpus Inscriptionum Latinarum*, Vol. III, S. 800, the most important being an inscription from Stratonice. The following are the lines that affect our enquiry :

Membranario in [qua] t[r]endone pedali pergamena.	[xl denarii]
Scriptori in scriptura optima versus n° centum.	[xxv]
Se[quent]is scripturae versuum n° centum.	[xx]
Tabellanioni in scriptura libelli bel tabular[um] in versibus n° centum.	[x]

The prices are wanting in the inscription from Stratonice, but they are supplied from a Phrygian inscription marked H in the *Corpus*.¹

The first thing to observe is the existence of two distinct types of writing, denoted respectively *optima* and *sequens*. These are, as we should say, large and small size; a study of the whole inscription gives many instances of this. Take for example the price of apples in the edict :

Mala optima Mattiana sive Saligniani	n° decem	* quattuor.
Sequentia	n° viginti	* quattuor.
Mala minora	n° quadraginta	* quattuor.

This establishes the use of the words *optimus* and *sequens* as relating to the *res venales*. Next observe that the prices of the two styles of writing are in the ratio of 25 to 20 or 5:4. Now the ratio of the heroic verse to the iambic is, as we have shown, very nearly 36:28 or 9:7, which is a very close approximation to the previous ratio. *The two types of writing of the Diocletian edict are therefore our two standard verses.*²

¹ M. Graux gives the prices differently, quoting apparently from Waddington, and is followed by Birt (*Buchwesen*, p. 208). They write as follows :

Scriptori in scriptura optima versuum No. centum . . .	
Sequentis scripturae	XL
Tabellanioni, etc.	XXV

Birt also seems to assume that "sequens" refers to quality rather than quantity: "das Monument unterscheidet hier wie überall nur zwei Sorten und bezeichnet die schlechtere als *sequens*."

² Dr. Bloomfield furnishes me with the following note :

In India, MSS are now copied and paid for by *çlokas* or *granthas*. The *çloka* is an iambic meter consisting of four times eight syllables, and any MS, whether

6. We observe that this table enables us to determine, to a close degree of approximation, the cost of the original transcription of the Codex Sinaiticus. Each page contains 96 iambic *στίχοι*, or almost the legal hundred; the cost is therefore 20 denarii a page: allowing $345\frac{1}{2}$ leaves to the manuscript, the expense is $345\frac{1}{2} \times 40$ denarii, or 13,820 denarii. And the date of the edict of Diocletian is so little anterior to the production of the MS that we cannot be far wrong in our estimate. But here we have only taken account of the actually existing portion of the MS, and have left out of the reckoning those portions of the Old Testament which are lost, and the 43 leaves of the Cod. Friderico-Augustanus.

Scrivener estimates the total number of leaves of the MS down to the place where Hermas breaks off at 724 at the outside: and admitting this estimate, we should have 28,960 denarii for cost of transcription.

Then comes the question of the cost of the vellum, and here again the Diocletian edict helps us to an estimate. According to the first of our quoted lines, a quaternion of four sheets or eight leaves of parchment, a foot in length, was to be sold for 40 denarii; now the Codex Sinaiticus is just over the foot in length (the Roman foot being taken to be 11.69 inches): and the vellum is of very fine quality. Allowing, then, 90 quaternions to the complete work, we put at least 3600 denarii for the material, which added to our previous reckoning gives 32,560 denarii for the complete work. If, however, we only regard the portion properly known as the Codex Sinaiticus, we have to add 1720 denarii to 13,820, giving a total of 15,540 denarii.

We conclude that the cost of a complete Bible must have been about 30,000 denarii; and Constantine's fifty Bibles for the churches of Constantinople must have been produced at an expense not very different from 1,500,000 denarii. To represent this in modern

prose or poetry, is now generally copied upon this basis of count. I received, myself, about a month ago two texts of the *Kāñçika-sūtra*, a ritualistic work written in short condensed sentences, and in prose. These sentences contain mnemonic rules for the conduct of sacrifices and sacraments, and are in form and context as far removed from poetry as possible. One of the MSS was estimated at 1700 *çlokas*, the other at 1750. The difference in the number is due to actual differences in the text, and to the fact that the count is made in round numbers.

A similar statement will be found in Gardthausen: Griech. Paläographie, p. 132.

money is more difficult; perhaps we shall not be far wrong in taking the estimate of M. Waddington, that the denarius = .062 francs.

Birt (*Antikes Buchwesen*, p. 209) sets the denarius down at .024 marks of modern money. This would make the scribe's pay, for 100 lines of hexameter size, .96 mark, sufficiently small to be a correct estimate of scrivener's pay; for the shorter pattern, .6 mark per hundred; while the cost of production of a complete Sinaitic Codex stands at 720 marks or thereabouts. It is not a little curious that the estimate which we have made of the cost of production of the books ordered by Constantine should approach so nearly to the price set by Tischendorf on the splendid edition of Sinaiticus produced by order of the Emperor Alexander II of Russia.

7. There remains one line of our edict to discuss. The notary (observe the curious form *tabellanio* for *tabellio*) or writer of the small book (*libellus*) or of tablets, is paid at a lower rate. According to the edict, he is paid only 10 denarii per 100 verses. We cannot be far wrong in assuming his lines to be half as short as the previous type; in other words, his lines are sensibly the same as the Sinaitic line, two of which go to the iambic *στίχος*. Now it is not unworthy of note that we find not a few manuscripts of the New Testament written on a model very little different from the Sinaitic Codex. They are a little shorter, averaging 11 letters to the line, and indicate an original written on very narrow strips of paper. To this type belong the MSS known as I, N, Γ (which are, perhaps, fragments of the same original); they are written in double columns, 16 lines to the page, and eleven letters to the line. Codex W is, perhaps, a little longer, 12 letters to the line, and in double columns, of 23 lines to the column.

8. The table which contains our calculation of the *στίχοι* for the separate books is deserving of a careful study. The first column is taken from Scrivener, p. 63 of Introduction to N. T. Criticism. He states that for the Gospels his figures are taken from Codd. G. S. and 27 Cursives named by Scholz. It will be observed that as a general rule the results of the second column exceed those of the third. But in the case of the Acts the order is nearly reversed. Probably the explanation is that the Acts is written more closely in Codex B than any other book, and so we have a smaller number of lines from which to calculate our *στίχοι*. The first column is at the beginning much

in excess of the second and third, probably in consequence of interpolations in the Gospels followed by Codices G. S, etc., or omissions in the great uncials. For the succeeding Epistles the second and third columns give as a rule results slightly in excess of the first, except for the Hebrews, where the Sinaitic Codex has some omissions to account for, and in James and I John.

We may actually test the results in the case of such short compositions as Philemon and the two shorter Epistles of John. By actual reckoning then on the II and III Epistles of John as given in Westcott and Hort's edition, we find 30 and 31 *στίχοι* respectively. The abbreviated forms are taken for *θεοῦ, ἡσοῦ, χριστοῦ*, but these abbreviations will not affect the result arrived at. For Philemon the same text gives 42 *στίχοι*; but if we do not abbreviate we must add nearly sixty letters; the last *στίχος* numbered 15 letters; and we have therefore to add about 39 letters or just over a verse, which brings the result very close to the calculation from the Sinaitic, or the estimate of M. Graux.

The result arrived at by M. Graux, and confirmed by our own researches, is in the first instance deduced from the fact that the average value of the *στίχος*, as calculated, fluctuates between very narrow limits. And I can imagine some one objecting that such a result would be a thing that any one might anticipate, and that we might just as well calculate the average length of a verse in the English Bible, and then draw the inference that these verses were constructed according to a pattern, which can hardly be believed in any strict sense. To reply to this objection, perhaps the simplest counter-argument would be to observe that, if there were really an average number of letters to the verse, fluctuating between limits as narrow in proportion as in the case of the number of letters to the *στίχος*, there ought to be an approximately uniform ratio between the number of *στίχοι* and the number of verses in the separate books; for if $\frac{m}{p}$ is approximately constant, where m is the whole number of letters in a book, and p the number of *στίχοι*, and if $\frac{m}{q}$ is also approximately constant, where q is the number of verses, then $p:q$ is approximately a constant ratio. We can at once test this point by taking the number of *στίχοι* and verses as given by Scrivener, Introduction to N. T., p. 63. The result of the enquiry is as follows:

	<i>στίχοι.</i>	<i>Modern Verses.</i>	<i>Ratio.</i>
Matthew	2560	1071	2.390
Mark	1616	678	2.383
Luke	2740	1151	2.380
John	2024	880	2.300
Acts	2524	1007	2.506
James	242	108	2.240
I Peter	236	105	2.247
II Peter	154	61	2.524
I John	274	105	2.514
II John	36	13	2.307
III John	32	15	2.133
Jude	68	25	2.720
Romans	920	433	2.124
I Cor.	870	437	1.990
II Cor.	590	256	2.304
Galat.	293	149	1.966
Ephesians	312	155	2.013
Philipp.	208	104	2.000
Coloss.	208	95	2.189
I Thess.	193	89	2.168
II Thess.	106	47	2.255
I Tim.	230	113	2.035
II Tim.	172	83	2.072
Titus	98	46	2.130
Philemon	38	25	1.520
Hebrews	703	303	2.320
Revelation	1800	405	4.444

That is (leaving out the case of Revelation, where the number of *στίχοι* is obviously apocryphal), the ratio varies between 1.52 and 2.72, which is more divergent than 3 to 5. In the longer compositions the ratio tends to uniformity, as we should expect. It is clear, then, that the average of M. Graux's results is something more than a mere numerical average, and implies the existence of an underlying type.

9. It is important that we should grasp the bearing of the previous researches upon the antiquity of the texts contained in the two great Uncials. Scrivener, in his collation of the Codex Sinaiticus, draws attention to the remarkable resemblance of the writing to that of the Herculanean papyri, none of which, as he ingeniously remarks, can be dated below A. D. 79. He draws a similar com-

parison with regard to the almost entire absence of marks of punctuation.¹ "The two manuscripts are near akin. In the Hyperides papyri are no stops at all, in the Herculean very few."² With regard to the columnar arrangement his remarks are even more suggestive. "Still more striking is the likeness which Cod. Sinaiticus bears to these records of the first century in respect to its outward form and arrangement. The latter are composed of narrow slips of the papyrus, the writing on which is seldom more than 2 or 2½ inches broad, glued together in parallel columns, and kept in scrolls which were unrolled at one end for the purpose of reading, and when read rolled up at the other . . . the appearance of the Sinai manuscript, with its eight narrow columns (seldom exceeding two inches in breadth, exhibited on each open leaf, suggests at once the notion that it was transcribed line for line from some primitive papyrus, whether written in Egypt or elsewhere."³

The main point to be noted is that the papyri from which our great manuscripts are transcribed must have been closely related, almost line for line, to the *original* papyri of the Gospels and Epistles, *or it is extremely unlikely that they would end in any other way on the pages than by random distribution.* And thus our investigation constitutes the proof of the important statement of Westcott and Hort, that "the ancestries of these two manuscripts diverged from a point near the autographs." They might almost have said "from the autographs." But when we establish this result, we reserve the important qualification, that these MSS are not exempt from occasional errors of omission or insertion of whole sheets and lines; nor are they entirely free from that error which arises from a derangement of the order of the sheets of which the original document was composed. The latter I believe to be peculiarly the case with the Gospel of John. How far such omissions and excisions are wilful, it is impossible to say; it is to such a case that the remark of Tertullian applies when he accuses Marcion of using not the pen, but the knife in his dealing with documents. He probably means to imply that whole strips of papyrus had disappeared from the rolls. But I think it will be found upon a closer examination of this difficult point, that the character of Marcion has been unnecessarily blackened, and that in many respects he will turn out to be almost a champion of textual purity. It became the fashion to brand every omission from

¹ Scrivener, Collation of Codex Sinaiticus, p. xiv.

² P. xxviii.

³ P. xxx.

the ordinary Church MSS with the name of Marcion. We find this charge made even by so noble a spirit as Origen with regard to the concluding verses of the Epistle to the Romans.

We now annex the table which gives the comparison between the number of *στίχοι* as quoted from early codices, and the number as calculated from the lines enumerated in tables I and II for the several books of the New Testament, on the basis of a number of lines in St. John's Gospel actually measured into *στίχοι*. Since we find our results frequently in coincidence or near it, and seldom differing from one another more than 5 per cent., the result is confirmatory of the previous statements made as to the fixed length of the *στίχος*. When allowance has been made for the omissions and insertions in the MSS, we may perhaps find it useful to recalculate the figures given.

TABLE IV.

$\frac{1}{1}$ V-line $= \frac{149}{326}$ <i>στίχοι</i> , $\frac{1}{1}$ S-line $= \frac{149}{414}$ <i>στίχοι</i> , $\log 326 - \log 149$ $= .340013$ $\log 414 - \log 149$ $= .443840$	<i>στίχοι</i> from Scri- vener's Intro- duction.	<i>στίχοι</i> estimated for Vatican Codex.	<i>στίχοι</i> estimated for Sinaitic Codex.	<i>στίχοι</i> from the second hand of Sinaitic Codex.	M. Graux's pro- bable number.
Matthew	2560	2442	2401		2560
Mark	1616	1492	1470		1616
Luke	2740	2629	2583		2750
John	2024	1865	1861		2024
Acts	2524	2497	2526		2556
Romans	920	944	918		920
I Cor.	870	886	885		870
II Cor.	590	608	607	612	590
Galatians	293	293	293	312	293
Ephesians	312	317	313	312	312
Philippians	208	216	210	200	208
Colossians	208	219	212	300	208
I Thess.	193	205	198		193
II Thess.	106	112	105	180	106
I Tim.	230		239	250 ?	230
II Tim.	172		174	180	199
Titus	98		100	96	97
Philemon	38		43		42
Hebrews	703		670	750	703
James	242	242	236		242
I Peter	236	244	245		236
II Peter	154	168	164		
I John	274	262	263		274
II John	30	31	31		32
III John	32	31	31		31
Jude	68	70	71		68
Revelation	1800		1179		

C. 1. When we proceed to examine in detail the various readings and errors of the principal manuscripts in the Catholic Epistles, we come to the conclusion that there is nothing to affect our results in the two smaller Epistles of John, nor in the Epistle of James. With regard to the first Epistle of John, the only passage where we can regard the text of B as uncertain is in IV 3, where the words *χριστὸν ἐν σαρκὶ ἐληλυθότα* are omitted, the length of the omission being a V-line, and the passage being retained by the Sinaitic Codex; and at IV 21 there is a line omitted by B. Then we come to the question of the celebrated passage I John V 7, or the "Three Heavenly Witnesses"; the text of this would occupy about five V-lines. Our method of investigation agrees with every other applied critical test in rejecting the words. The abnormal excess of the number of *στίχοι* noted in some early codices of St. John over the number as calculated by ourselves, leads to the suspicion that there may have been Greek codices, now lost, in which the words occurred. The defenders of the passage, if there are any left, can actually count the *στίχοι* in the first Epistle of John and compare their results with the number as given by Scrivener. The disputed passage is a matter of 3 *στίχοι*.

2. The Epistle of Jude is an interesting study from our point of view. There are no various readings that are likely to affect the arrangement of the Epistle; in the 15th verse the text of the Sinaitic is perplexing, and in the 25th verse both the oldest codices agree in the addition of two V-lines to the ordinary text. But the significant feature of the examination of the text is the discovery that the scribe of the Sinaitic Codex has in v. 12 mistaken the *οὗτοί εἰσιν* of the verse for the same words in v. 16, and has consequently interpolated four lines from that verse before detecting his error and returning to the proper passage. His eye has, *apparently*, wandered from the top of a column nearly to the bottom in search of the words which he had either recently transcribed or was proposing to transcribe. We need scarcely say that such a supposition is extremely unlikely. When, however, we restore the pages to the S-form, as they may be easily exhibited, we see that the scribe's eye has really only wandered from the first line of the column he was transcribing to the first line of a column not very remote from it, and commencing with the very same words. And this is so thoroughly likely that it must be regarded as no slight confirmation of our theory of the subdivision of the columns.

It is not to be necessarily inferred that the Epistle was originally written on the S-page; we have already seen reason to assume the opposite type (unless, indeed, the doxology should be shown not to be genuine); but the point that we press is the fact of the reduction of smaller pages into the form given in the Sinaitic Codex. From the same enquiry another result follows: the ratio of the S-lines to the V-lines for this Epistle was abnormally high, but when we proceed to subtract the four lines inserted by the Sinaitic, and recalculate the ratio, we find 1.268 instead of 1.293.

3. We proceed to examine the text of the first Epistle of Peter, which we do more in detail in order to illustrate the methods by which we restore the text, prior to dividing it into the smaller pages.

I Peter.

	<i>Letters.</i>	<i>Text Rec.</i>	<i>Σ</i>	<i>B.</i>	<i>W. H.</i>	<i>Tr.</i>
I 22. διὰ πνεύματος	12	+	—	—	—	—
I 23. εἰς τὸν αἰῶνα	11	+	—	—	—	—
III 5. ἐκόσμου ἐναντίας	14	+	—	+	+	+
III 7. κατὰ γνώσιν	10	+	—	+	+	+
IV 5. ἀποδώσουσιν λόγον	16	+	—	+	+	+
III 16. ὑμῶν ὡς κακοποιῶν	15	+	+	—	—	[—]
IV 14. καὶ δυνάμεως	11	—	+	—	—	—
IV 14. κατὰ μὲν αὐτοὺς βλασφη- μεῖται κατὰ δὲ ὑμᾶς δοξά- ζεται	44	+	—	—	—	—
V 2. ἐπισκοποῦντες	13	+	—	—	—	+
V 5. ὑποτασσόμενοι	13	+	—	—	—	—
V 10. θεμελιώσαι	10	+	+	—	—	—

In addition B omits the whole of V 3, containing 58 letters, *i. e.* between 3 and 4 Vatican lines, which will certainly make the text eight Vatican columns, and 36 lines, but it does not fill the page. In the Sinaitic we have, besides the variants noted, and some smaller ones, six short columns, so that in S-pages we have 14 columns and one or two lines, which seems to indicate 56 S-pages. The letters missed or inserted look like complete Sinaitic lines, which again confirms our opinion that the original form of the document is the S-page.

When we add the missing lines to the texts and calculate afresh the ratio of the V-line to the S-line, we have 1.250.

Another remarkable confirmation of our subdivision of the Sinaitic pages is found at II 12 of this Epistle. The scribe left his work at the beginning of the 21st S-page, where he was about to transcribe the words *δοξάσωσι τὸν θεόν*. These words stand at present at the second line of the page. But, in returning to his task, he opened at the second Epistle of Peter by mistake, and here at the 11th verse of the second chapter he found the key-word *δόξας* and began to write *δόξας οὐ τρέμουν*, thus transcribing what would be the first line of the 19th S-page in the second Epistle of Peter. The traces of the error still remain. *And it is impossible to give a rational explanation of the aberration of the scribe unless we subdivide the pages in the manner we have indicated.*

3. In the 2d Epistle of Peter we rectify the text in a similar manner, the two most important phenomena being that the Sinaitic scribe has in I 12, 13, omitted 8 lines, from *διὸ μελλήσω το διεγείρειν*, and that the error is almost balanced by the existence of nine short columns.

More important still is the light which the rectification of the pages throws on a very difficult passage in III 10, where the reading adopted by Westcott and Hort is a source of immense merri-ment to Dr. Burgon. The ordinary reading in this passage is

καὶ γῆ καὶ τὰ ἐν αὐτῇ ἔργα κατακρίσεται.

For *κατακρίσεται* (which is the reading of A, L, the Clementine Vulgate, the Memphitic, and some other versions) the two earliest MSS read *εὐρεθήσεται*, and are supported by sundry versions and by Codex K. Codex C suggests *ἀφανισθήσονται*.

Tregelles and Westcott and Hort import the utterly meaningless *εὐρεθήσεται* into the text, apparently on the ground that it is safe to follow ten times in succession a group of manuscripts which is demonstrated to be reliable in nine cases out of ten.

Burgon, on the other hand, will have the ordinary reading to be correct, and affirms the reading of Codices \aleph to B to be a rude attempt of some Western scribe to translate or transliterate the Latin word *urentur*! More strangely still, so judicious a critic as Farrar is found supporting this peculiar suggestion, and even claims the paternity of the monster. Thus he remarks: "It had occurred to me, before I saw it remarked elsewhere, that it might be some accidental confusion with the Latin *urentur*" (Early days of Christianity, p. 121).

We now turn to the Sinaitic Codex, and observe that exactly 24 lines beyond the disputed passage lie the words *αὐτῷ εὐρεθῇ | ναι ἐν*

εἰρήνη. Moreover, the passage in dispute occurs within a line of the bottom of one of the Sinaitic columns, and, in all probability, when the passage is rectified, the words are either the highest or the lowest line of an S-page. The scribe's eye, therefore, wanders laterally two columns, and hence the word εἰρεθίσεται. This explains the origin of the variant. We infer also from the discrepancy of later copies that we have here a case in which the original reading is entirely lost and the text has been restored by a conjectural emendation.

Further, since the error took place in a MS of the S-type, it follows that that type is nearer to the autograph of the Epistle than any other, which is exactly in accordance with our previous enquiry; for, otherwise, some manuscript would, doubtless, have conserved the original reading. The conjectural restoration made by the early MSS is not based upon any critical study of the text; and in order to fill the blank left by the removal of εἰρεθίθῃ, we must endeavor to determine the causes which led to the error. These are (1) the similarity of ἀντῇ in v. 10 to ἀντῶ in v. 14; (2) the similarity either to eye or ear of the words which have become confounded.

A reading which would satisfy both conditions would be ἐκρηθήσεται, which Professor Gildersleeve suggests.¹ We find a similar word ἀπορρηθήσεται in some MSS of Barnabas c. 11, the passage being really a quotation from the first Psalm; and ἐξερύημεν is the word used for the fading leaf in Isaiah 64, 5. This exactly expresses the idea of the writer.

4. We now turn to the Pauline Epistles, in which we return to our first approximation to the number of the original pages of the autographs, and examine the manner in which the results are affected by the principal errors, reserving all our conclusions for a closer scrutiny in connexion with the original documents at some later time. It is extremely unfortunate that there is no critical apparatus to the New Testament except Scrivener's collation of the Sinaitic, which records the accidental omissions or repetitions of the great uncials; we are, therefore, obliged to collate for ourselves the text of every book, in order to see that no lines are dropped or repeated. And this, in spite of the compensations arising from a close study of the early arrangement of the text, is somewhat tedious and demands a great deal of time.

¹ I see that Westcott & Hort make a similar suggestion in their introduction, and disown the very reading which they adopt.

I Thessalonians.

		Letters.	Text Rec.	Σ	B.	W. H.	Tr.
I	1. ἀπὸ θεοῦ πατρὸς ἡμῶν καὶ κυρίου Ἰησοῦ Χριστοῦ	?24	+	+	—	—	—
II	16. τὰς ἀμαρτίας	11	+	+	—	+	+
III	2. καὶ συνεργὸν ἡμῶν	15	+	—	[+]	—	—
V	8. καὶ ἀγάπης	9	+	—	+	—	—

These are the only three readings of any importance. The Epistle is written on the V-page to the full, and will not bear any additions; we agree with the editors in rejecting the first reading. The second reading is remarkable, as there has been a conflation by the Textus Receptus and late copies of the two simple readings καὶ διάκονον τοῦ θεοῦ and καὶ συνεργὸν ἡμῶν. Either of the alternative readings may be taken, and the length of the Epistle is not affected by our choice, provided we do not make the error of conflation and take them both.

The third reading is an omission on the part of the Sinaitic. At II 13 the Sinaitic has repeated 10 lines by ὁμοιοτελευτον of the letters ωντουθεον. We have thus to reduce the estimate made for the Sinaitic Codex by 11 lines, and leaves us with 11 columns and 10 lines, or very nearly 45 S-pages.

But now the question arises, why should the scribe have wandered back 10 lines in search of τοῦ θεοῦ? The interval is a very improbable one as the MS is written, but when the pages are rectified it will be found that the aberration of the scribe's eye is almost entirely lateral, and does not amount to a couple of lines vertically.

5. II Thessalonians: Here we have both codices ending unevenly, the Sinaitic at the third line, and the Vatican at the 34th line. The text, moreover, is extremely exact. Marcion is said to have omitted in I 8 ἐν φλογὶ πυρός, 13 letters; in II 4 the Sinaitic omits καὶ υπεραϊρόμενος, 16 letters; and in II 15 it omits ὁ ἀγαπήσας ἡμᾶς, 12 letters. In III 4 the Vatican text has inserted καὶ ἐπούσατε, 12 letters. These seem to be all the readings of any importance.

A reference to the Codex Sinaiticus shows us the following peculiarity: it has twice made a single line of the two letters χῡ, and twice made a single line of ιῡ χῡ; the four instances are as follows:

I 2. ιῡ χῡ a fresh line, probably rendered necessary by the insertion of the word ἡμῶν.

I 8. ευαγγελι | ω του κῡ ημων ιῡ | χῡ, where the word χῡ is rejected by all the editors.

I 12. *κατα την χαριν του* | *θῦ ημων και κυ ιῦ* | *χῦ*, where the word seems genuine.

II 14. *περιποιησιν δο* | *ξης του κυ ημων* | *ιῦ χῦ*, where the last line is genuine.

There are one or two other very short lines. It is probably in these short lines that the explanation is to be sought of the three extra lines above pattern in the Sinaitic Codex. It will be observed that the errors of the Epistle are mainly S-errors. We conclude that the Epistle is probably represented by 24 S-pages. The result is confirmed by observing that in III 4, B has conflated the two readings *ποιείτε και ποιήσετε, ἐποιήσατε και ποιείτε* into *ἐποιήσατε και ποιείτε και ποιήσετε*. It seems unlikely that this would happen if the text of B in this Epistle were modelled on the original tradition.

6. I Corinthians : The text is very good. At the beginning of c. XIII the scribe of the Sinaitic has dropped 134 letters, from *γέγονα χαλκός* to *ἀγάπην δὲ μὴ ἔχω*. The error, which is almost exactly 10 S-lines, was due to the fact that a previous sentence ended also with *μὴ ἔχω*. Moreover, the error is facilitated, as in the case mentioned above, by the existence of the smaller pages, which bring the two similar passages into contiguity. Other errors are the repetition of four lines in I 8, the omission of four lines in II 15, the omission of a line in X 19; of two lines in XV 13, and of four lines in XV 26, 27.

		<i>Letters.</i>	<i>Text Rec.</i>	Σ	<i>B.</i>	<i>W. H.</i>	<i>Tr.</i>
I 27.	<i>ἵνα τοὺς σοφοὺς . . . ἐξελέξατο ὁ θς</i>	54	+	+	+	+	+
III 3.	<i>και διχοστασία</i>	14	+	—	—	—	—
VII 5.	<i>τῇ νηστείᾳ και</i>	12	+	—	—	—	—
XI 24.	<i>λάβετε φάγετε</i>	12	+	—	—	—	—

Our table must now be corrected so as to make the epistle 206 S-pages and several lines.

7. II Corinthians : The principal errors are as follows :

		<i>Letters.</i>	<i>Text. Rec.</i>	Σ	<i>B.</i>	<i>W. H.</i>	<i>Tr.</i>
VIII 4.	<i>δέξασθαι ἡμᾶς</i>	12	+	—	—	—	—
IX 4.	<i>της καυχήσεως</i>	12	+	—	—	—	—
XII 7.	<i>ἵνα μὴ ὑπεραίρωμαι</i>	16	+	—	+	+	[—]
XII 11.	<i>καυχόμενος</i>	10	+	—	—	—	—

Here the errors, though few, are chiefly of the S-type; from the readings given we might perhaps add 16 letters to the Sinaitic text. But this would still leave a large blank in a sheet. On the other hand,

the V-pages fit exactly, only we must allow for the omission by B of a line in I 13 and the repetition of four lines in III 16.

8. The Epistle to the Romans does not seem to conform, as yet, very closely to any type.

Perhaps the explanation of this fact may be in the repetition by Codex B of four lines at IV 4, from *ὁ μισθὸς τοῦ ἐργαζομένου*. This would make the Epistle 148 V-pages.

There is a further difficulty about the concluding salutations and doxology, the consideration of which is very important, because in the first place Origen¹ distinctly charges Marcion with having excised them; secondly, we find them inserted in some codices at the end of the fourteenth chapter; thirdly, some codices, notably Codex A, which can hardly ever resist an opportunity of conflation of documents, have retained the doxology in both places; fourthly, Marcion is also charged with the excision of the remainder of the Epistle from the end of the fourteenth chapter. It becomes interesting to examine the length of this portion in Vatican type. At present it does not look as if Marcion had done anything of the kind attributed to him.

The doxology starts at the top of a column, *ΤΩ ΔΕ ΔΥΝΑΜΕΝΩ ΜΑΣ*, and occupies in the manuscript 16 lines and 4 letters. Moreover, the portion from Rom. XVI 1 to the end which contains all those very doubtful salutations to people whom one can hardly believe to have been at Rome, contains very nearly 10 V-pages with the doxology; or nearly 9 V-pages without it. We may conjecture that these 9 V-pages are really a part of the subscription to another Epistle. It is not, however, a point material to our hypothesis, viz. that the Epistle to the Romans was written on the V-page.

In Romans the text is very exact.

			Letters.	Text.	Rec. Ν	B.	W. H.	Tr.
VIII	1.	μὴ κατὰ σάρκα . . . κατὰ πνεῦμα	37	+	—	—	—	—
IX	28.	ἐν δικαιοσύνῃ . . . συντεταγμένον	33	+	—	—	—	—
X	15.	τῶν εὐαγγ. εἰρήνην	25	+	—	—	—	—
XI	6.	εἰ δὲ ἐξ ἔργων . . . οὐκ ἔτι ἐστὶν ἔργον	53	+	—	[+]	—	—
XII	17.	ἐνώπιον τοῦ θυ καὶ	15	+	—	—	—	—
XIII	9.	οὐ ψευδομαρτυρήσεις	18	+	+	—	—	—
XIV	6.	καὶ ὁ μὴ φρονῶν . . . οὐ φρονεῖ	31	+	—	—	—	—
XIV	21.	ἢ σκανδαλίζεται ἢ ἀσθενεῖ	22	+	—	+	—	+
XV	13.	εἰς τὸ περισσεύειν ὑμᾶς	20	+	+	—	+	+
XV	32.	καὶ συναναπαύσονται ὑμῖν	21	+	+	—	+	+
XVI	12.	ἀσπάσασθε Περσίδα κ. τ. λ.	49	+	+	+	+	+
XVI	24.	ἡ χάρις τοῦ κυ κ. τ. λ.	39	+	—	—	—	—

¹Orig. Int. IV 687.

The majority of these readings are of the V-type, and the text can now be easily rectified. The question of the salutations is more difficult; as already stated, we conjecture that they are a separate document, really intended as a codicil to the Ephesian Epistle; but, having been written on the V-type, a mistake easily arose in reducing the documents, and finding an Epistle of the S-type carrying final leaves of the V-pattern.

9. Galatians: The only reading of any importance is in III 1:

	<i>Letters.</i>	<i>Text. Rec.</i>	Σ	<i>B.</i>	<i>W. H.</i>	<i>Tr.</i>
τῇ ἀληθείᾳ μὴ πείθεσθαι	20	+	—	—	—	—

We can, at the most, add one line to the Vatican text; but this we must not do, first, because of the consensus of authorities and editors against the reading; and, secondly, because the large writing of St. Paul in the close of the Epistle would run over into another page if the reading were admitted, a most improbable event. On the other hand, B has repeated a line in I 11.

There is no reasonable conclusion other than that the Epistle to the Galatians was written on 47 V-pages. The single reading quoted seems to be of the V-type.

10. Ephesians: At first sight this Epistle seems not to be written on full sheets; or, if so, not on sheets of the V- and S-type. In one Codex, B, it occupies 16 columns and 22 lines, *i. e.* six lines less than 50 V-pages; and in the other it occupies 18 columns and five lines, *i. e.* seven lines less than 73 S-pages. We proceed to examine the codices, and to discuss those variations of the text which may affect seriously the space that it occupies.

And first of all we find that the scribe of **Σ** has omitted the seventh verse of the second chapter, which has been inserted in a footnote. The reason of this error lies in the fact that both the sixth and seventh verses close with the words *ἐν χῶ ὡ*, and probably at the same part of the Sinaitic line. The 101 letters of this verse show that it would occupy about seven or eight lines of Sinaitic type. Adding them we correct our table, which now states that Ephesians in the Sinaitic Codex occupies 73 S-pages and one line. Further, he has repeated three lines in VI 3, in the words *ὡα ἐν σοι | γενῆται καὶ ἐση | μακροχρονίος | ἐπὶ τῆς γῆς*. At III 18 he has again repeated a line. This makes the Epistle 73 S-pages, all but three lines.

We now proceed to discuss the various readings.

		Letters.	Text. Rec.	Ⲱ	B.	W. H.	Tr.
I	1. ἐν ἐφέσῳ	7	+	—	[+]	[+]	+
I	3. καὶ σωτήρ	10	—	+	—	—	—
I	15. τὴν ἀγάπην	9	+	—	—	—	+
III	14. τοῦ κυ̅ ἡμῶν χυ̅ ιϛ	13	+	—	—	—	—
V	22. ὑποτάσσεσθε	11	+	—	—	—	—
	οἱ ὑποτασσέσθωσαν	14	—	+	—	—	+
V	30. ἐκ τῆς σαρκὸς αὐτοῦ καὶ ἐκ τῶν ὀστέων αὐτοῦ	35	+	—	—	—	—
VI	12. τοῦ αἰῶνος	9	+	—	—	—	—
VI	20. τοῦ εὐαγγελίου	13	+	+	—	[+]	+

These are the principal passages, and we see that on the most extreme methods of criticism it would be possible to add five to seven lines to the Sinaitic Codex, or in the opposite direction to remove two lines. But it is evident that there are really only two passages to discuss, the one a question of adding a line to the Sinaitic text, the other of subtracting two lines. These readings can hardly affect our result, which gives us 73 S-pages. This Epistle is a good illustration of the rule that a document originally written on the V- or S-pattern will show a majority of V- or S-errors, as the case may be.

11. Philippians: Here there are only two important readings:

		Letters.	Text. Rec.	Ⲱ	B.	W. H.	Tr.
III	16. κανόνι, τὸ αὐτὸ φρονεῖν	19	+	—	—	—	—
III	21. εἰς τὸ γενέσθαι αὐτὸ	17	+	—	—	—	—

Its errors are both of the V-type. The Codex B shows us 33 V-pages in the Epistle, which will not, therefore, admit of an extra line being inserted. But in noticing this apparent leaning to the V-type, we must not forget that the Epistle is only three lines short of a page in the S-type, which allows us, if we think proper, to admit one or both of the longer readings. Moreover Ⲱ has dropped a line at II 18.

12. Colossians: Here we had 11 columns and 15 lines in Codex B.

12 " 13 " Sinaitic.

In either case just over the page, which is the most improbable thing that can happen.

The principal readings are :

	<i>Letters.</i>	<i>Text. Rec.</i>	<i>ⲛ</i>	<i>B.</i>	<i>W. H.</i>	<i>Tr.</i>
I 2. καὶ τοῦ κϣ χϣ ιϣ	9	+	+	—	—	—
I 6. καὶ αὐξανόμενον	14	—	+	+	+	+
I 14. διὰ τοῦ αἵματος αὐτοῦ	15	+	—	—	—	—
I 25. ἐγὼ Παῦλος διὰ	12	—	+	—	—	—
II 2. καὶ πατὴρ καὶ τοῦ	15	+	[+]	—	—	—
II 11. τῶν ἁμαρτιῶν	11	+	—	—	—	—
III 6. ἐπὶ τοὺς υἱοὺς τῆς ἀπειθείας	24	+	+	—	—	—

Of these readings I 2 is an exact line in the Sinaitic, it is probably an addition. I 6 is also an exact line, and has been dropped by a few codices. I 14 is generally admitted to be an interpolation. At I 23 and at I 25 a line has been added by ⲛ. II 2 is very doubtful. II 11 is probably an addition. III 6, the passage is rejected by B only, and perhaps D ; it is very likely genuine. We infer that of three places where the Sinaitic contradicts the Vatican, it is incorrect in two of them. The Epistle is now one or two lines short of 49 pages of the S-type. The errors are about evenly divided between the two types. The result is confirmed by observing that in I 12, Cod. B has been guilty of conflation of the two readings *ικανώσωντι* and *καλέσαντι*, so as to make *καλέσαντι καὶ ικανώσαντι* ; it seems hardly likely, then, that B contains the original type of the text of Colossians.

13. Philemon is, as already shown, 10 S-pages exactly.

14. Now let us examine the arrangement of the Gospel of Luke. Our enumeration of columns and lines gives us for the Gospel 401 V-pages or 598 S-pages. But neither of these results can be accepted, on account of the numerous and important variants which have to be considered. It is interesting to notice that the two results are very nearly in the ratio of 2 : 3. This would be exactly the case if two codices were written, one on a 12-lined page and with 14 letters to the line, and the other on a 14-lined page and with 18 letters to the line, for $12 \times 14 : 14 \times 18 = 2 : 3$. Now the two great MSS very nearly fulfil this condition ; it does not, therefore, surprise us if, when one codex suggests 400 V-pages, the other suggests 600 S-pages.

Now, turning to the Gospel of Luke, we notice in the first place that the passage containing the account of the Agony in the Garden has been excised from or is wanting in the chief exemplars. The Vatican Codex omits, the Sinaitic brackets it. I pointed out in my recent lectures that it was conceivable, as Epiphanius states, that

καὶ ἐκλαύσε
ὠφθῆδε αὐτῶα
γελοῦσά τοι ὕρανον
ἐνισχύων αὐτὸν
καὶ γενόμενος
ναῖων ἰακτενε
στερόν τοι προσηύ
χετο καὶ ἐγενετο
ἰδρῶσά τοι ὤσι
θρομβοὶ αἱματος
καταβαίνοντες
ἐπὶ τὴν γῆν

the passage was excised for doctrinal reasons, and that there were probably other words, *καὶ ἔκλαυσε*, which had never found their way back into the text.¹ Counting the letters of the doubtful passage, and adding, if it be thought necessary, 10 letters for *καὶ ἔκλαυσε*, we have 155 letters, or almost exactly an S-page. Here we have a strong intimation that the Gospel was originally written on the S-page, and that the account of the Agony is an authentic part of the text, easily lost or excised.

Turning to the Sinaitic Codex we find that the passage occupies eleven lines exactly, without the words added by us, and is evidently easily detached from the main body of the text. In the plate annexed the passage is completed, and given as a specimen of the S-page.

Assuming for the present that the S-page is the original form of Luke, we examine the next important passage, bracketed by Westcott and Hort, Luke XXII 19, 20 from *τὸ ὑπὲρ ὑμῶν διδόμενον . . . τὸ ὑπὲρ ὑμῶν ἐκχυννόμενον*. At first sight it seems that the omission of this passage by the Western text might be due to *ὁμοιοτέλεον*, but a closer examination shows that it contains 152 letters, or almost exactly an S-page; in the Sinaitic Codex it occupies 12 lines and 7 letters, but one of the lines is a very short one and has only three letters. It looks again as if an S-page had been either omitted or inserted; if both the passages which we have discussed were actual pages of the original document, the intervening space ought to be an exact number of S-pages, *i. e.* the space between the *ἐκχυννόμενον* of the second passage and the commencement of the account of the agony in the garden. Examination of the MS shows the intervening space to be a column and 33 lines, or within three lines of being 7 S-pages. It is doubtful, therefore, whether this passage be an integral part of the original document; and bearing in mind the suspicious resemblance to a passage in I Cor., we leave the matter in suspense until we have examined the remaining variants. If we see reason to conclude that it is really a part of the text, we shall most probably find that there has been some displacement of the text in the neighborhood. Before passing we observe that the 34th verse of the XXIII chapter, which Westcott and Hort bracket, is also marked with suspicion in the Sinaitic and occupies four lines of the text.

The doubtful 12th verse of chap. XXIV in the Sinaitic Codex begins a line, and occupies 8 lines all but four letters; moreover, the passage has dropped four letters from the text en route in the word *μόνα* after *δθόνια*.

¹ Epiph. Ancor. xxxi.

We now proceed to examine the text in detail, much in the same way as we discussed the Gospel of John; the list of variants is very long, as the text is many times more corrupt than that of John, and we therefore content ourselves with giving approximate results, deduced from a long array of doubtful passages.

The first thing that strikes us in studying the portentous list of various readings is that the greater part of the book is marked by omissions, but when we come to the last two chapters we find a large number of suspicious additions, contradicted by the Western text. It looks painfully like as if the space lost by omissions in the early parts of the book had been utilized in the latter part for some additional matter. Examining the cases where the Sinaitic text is erroneous, or probably erroneous, we have on the whole, up to XXII 25, forty-six lines to add, the criticism of the text being comparatively easy. Now the doubtful passage contained in XXII 43, 44 begins on the tenth line from the bottom of a column, but when the forty-six lines are added it falls at once into the proper place, the last section of a column. This would leave the Gospel, if undisturbed, to finish on the 23d line of a column; but now the criticism becomes extremely difficult.

- In XXII 31. The MS is probably correct.
 XXII 64. “ “
 XXII 68. “ “
 XXII 62. Two lines have perhaps been added.
 XXIII 17. Three lines must be removed.
 XXIII 38. Correct.
 XXIII 34. Probably four lines have been inserted, but the
 passage is very difficult.
 XXIV 12. Eight lines perhaps added.
 XXIV 31. A line lost.
 XXIV 4. A line probably added.
 XXIV 6. Two lines probably added.
 XXIV 40. Four lines perhaps added.
 XXIV 36. Two “ “
 XXIV 46. }
 49. } Text correct.
 XXIV 51. Text probably correct.
 XXIV 52. Probably two lines added.
 XXIV 53. Text probably correct.

The result being that 23 lines have been probably added, if we retain the passage XXIII 34 as probably authentic. That is to

say, 2 S-pages, all but a line, have now to be removed. But we added previously 4 S-pages, all but a line (if we reckon *καὶ ἔκλαυσε* in XXII 43); we have therefore on the whole added two S-pages, together with a lost page. Our original estimate was 598 S-pages, it is now 601 S-pages. Nothing can be more significant than this number of the fact that an S-page too many has crept in, and it can hardly be any other than the passage which we were in doubt about in XXII 19; we therefore finally decide to remove it.

The analysis has been extremely suggestive to our own mind; we started out with the prospect of reinserting the majority of the passages usually reckoned as doubtful, but the singular predominance of additions in the closing chapters over omissions has finally led us to reject those passages, or the majority of them, in accordance with the Western text; and we have finally ended with a book of 600 pages almost exactly, which we are now prepared to print on what we believe will represent, *quam proxime*, the original sheets of uncial writing. It will be observed that the frequency of errors of the S-type in the analysis of this Gospel confirms our supposition that this is the original form of the Gospel.

15. The Acts of the Apostles is one of the books which we have indicated to ourselves as likely, from its abrupt conclusion, to be written on full sheets. When we proceed to examine the principal doubtful passages, we shall find that the majority of the errors are of the S-type. There are nearly fifty passages that have to be examined, and from these, by the use of the best critical apparatus, we proceed to correct the text of the Sinaitic Codex, in which the S-type, if it exists, is preserved.

The following are the passages requiring change:

- II 9. + *καὶ ἐλαμῖται.*
- II 20. + *καὶ ἐπιφανῇ.*
- II 21. A whole verse has been omitted, 4 S-lines.
- II 43. A sentence has been inserted, 38 letters: *ἐν Ἱερουσαλὴμ φόβος τε ἦν μέγας ἐπὶ πάντας καὶ.*
- VII 60. + *φωνῇ μεγάλῃ.*
- IX 12. + *ἐν ὁράματι.*
- XIII 23. + *ἀπὸ τοῦ σπέρματος.*
- XIV 20, 21. Two verses omitted, 66 letters, 5 S-lines.
- XV 32. + *καὶ ἐπεστῆριξαν.*
- XXI 13. + *κλαίοντες καὶ.*
- XXI 22. — *δεῖ πλήθος συναλθεῖν.*
- XXVIII 27. + *καὶ τῇ καρδίᾳ συνῶσιν.*

This leaves us on the whole with about 14 lines to add to the Sinaitic text, which now occupies (a result by no means aimed at, and scarcely anticipated) 144 columns and 24 lines, or 578 S-pages. I do not however regard this result as more than a rough preliminary examination.

I am inclined to believe that a number of pages have been lost from the conclusion of the book. The celebrated passage VIII 37 consists of about 96 letters, perhaps 8 S-lines; so it cannot be restored, on the ground of a page having been lost from the original document. It is not unworthy of note that we have seen reason to refer the Gospel of Luke to the same type and to an original document of about 600 unit sheets.

16. We shall now defer the examination of the remaining books, reserving the discussion of them, together with the important question of the closing verses of St. Mark, and some other points of interest, for another occasion; and we shall conclude this present article by a brief examination of one or two early uncial texts by the light of the results already obtained, and by indicating a more general method of determining the autograph forms of any given collection of letters.

D 1. Codex Alexandrinus is written in tolerably uniform lines, and in double columns. The number of lines to the page is normally 50, but sometimes 51, and in one or two instances we note 49. In other words, the normal size of the page copied has been affected by omissions and additions, but principally the latter. The table for this codex is as follows:

	<i>Columns</i>	<i>Lines</i>
Matthew begins at c. XXV 6	?	6
Mark	50	17
Luke	86	20
John	53	48
or counting the two leaves lost VI 50 to VIII 52	61	48
Acts	80	7
James	7	48
I Peter	7	47
II Peter	5	11
I John	10	26
II John		49
III John		51
Jude	2	6
Romans	28	32

	<i>Columns</i>	<i>Lines</i>
I Cor.	28	21
II Cor.	19	38
Galatians	9	39
Ephesians	10	39
Philippians	6	48
Colossians	6	48
I Thessalonians	6	27
II Thessalonians	3	23
Hebrews	23	16
I Tim.	7	31
II Tim.	6	14
Titus	3	19
Philemon	1	18
Revelation	34	28

It will be observed that II John and III John no longer agree in the number of lines, the column on which the second Epistle is written being wider than that on which the third Epistle is written; this latter column has been narrowed in order to make room for a much wider column in the Epistle of Jude, which sometimes contains as many as 29 letters to the line.

In this MS the books do not begin uniformly at the top of the page, which shows that the orderly arrangement of the original matter is disappearing. Thus, I John does not begin at the head of a page; we have first 29 lines, then 9 columns, then 47 lines, and so we end near the foot of a column. II Cor. begins in the middle of a page; we have 21 lines, then a column of 49 lines only, then 18 more columns counting the three lost leaves, and then 18 lines. One thing, however, is very remarkable in the table, and that is the way in which the concluding lines group themselves around the numbers which are multiples of ten. It will be worth while examining this point.

Theoretically, the terminal digits of the lines 1, 2, 3, . . . 0 ought to be tolerably evenly distributed, but when we examine we find

0 occurs once.	5 occurs not at all.
1 " 4 times.	6 " 4 times.
2 " once.	7 " 4 times.
3 " once.	8 " 8 times.
4 " once.	9 " 4 times.

Now this extraordinary preference for the numbers 1, 6, 7, 8, 9 is not accidental, but is a survival of the original methods of arranging the documents.

The fact is that this document was probably originally reduced from documents of which one page is equivalent to the fifth part of the Alexandrian column; and the matter of the original documents was so arranged that the final page was more than half filled. This explains the preference for the endings which occupy the latter halves of the decades. The question arises, was this arrangement of the matter arbitrary, or are there any residual traces of the original pages?

An examination of this point will, I think, show that there was a time when the fifth of the column of Codex A was a V-page, but the traces have almost disappeared. This may be seen to be roughly the case by calculating the letters for 10 Alexandrian lines, which amount to something over 230, not far from the average letters of a V-page. And the suspicion is confirmed by remarking that the II and III of John, which are a column in A, are 5 V-pages. The arrangement would be suggested by the fact that the number of pages in so many of the different Epistles is a multiple of five or near it. We may detect the residual traces of the primitive form by taking some portion of an Epistle and examining its texts side by side for the two codices. Let us take the beautifully uniform writing of Codex B as our measuring line; and begin with one of the shortest Epistles, say the II John. By hypothesis 10 lines of A ought to be one V-page. Actually the first ten lines of A have lost two letters from the first fourteen lines of B. The scribe crowds the next line with five or six extra letters, and by the end of his 20th line is two letters ahead of the pattern. By the 30th line he is 6 or 7 letters ahead, and by the 40th line he is 12 letters ahead, thus enabling him to finish the epistle in nine more lines.

Next, let us try the first Epistle of John. The 10th line of A does not agree with the 14th of B in its ending, but we note a coincidence in ending of the

11 of A and the 14 of B

and the following successive coincidences at ending—

23 of A and the 31 of B	60 of A and the 76 of B
33 “ 44 “	62 “ 79 “
48 “ 64 “	65 “ 83 “

These give us the following and other relations between the A and B line :

$$\begin{aligned} A &= 1\frac{1}{4} B \\ A &= \frac{4}{3} B \\ A &= 1\frac{3}{8} B \\ A &= \frac{4}{3} B \\ A &= \frac{3}{2} B \\ A &= \frac{4}{3} B \\ \text{so } A &= \frac{3\frac{1}{2}}{2\frac{3}{8}} B, \text{ and so on,} \end{aligned}$$

the variety of which is striking; and the results vary much from our hypothesis $A = \frac{7}{5} B$.

The same irregularity in the text of A may be illustrated by studying the Epistle to the Galatians. The first 10 lines are exactly a V-page. The next 11 lines are a V-page and 8 letters. The next 10 lines bring us into agreement with the foot of the Vatican column all but a single letter; so that in these three V-pages Codex A has gained a line on its normal type. Or take the Gospel of John: The first 11 lines of A contain the V-page and 2 letters. The first 22 lines contain exactly the two V-pages. The next twelve lines contain a V-page and 2 letters. The next eleven lines end five lines in advance of the V-page; and finally the scribe succeeds in ending his page exactly with the 8th line of a V-page. So that A is exactly six lines behind time on its first column.

It is a wonder, when we examine the irregular writing of A, that we were able to find any trace at all of its original pattern, if indeed we have found it correctly.

2. The following table, in which, by the hypothesis, the pages of Codex A are approximately reduced to V-pages and compared with the Vatican Codex, will be useful :

	<i>A</i>	<i>B</i>
Mark	251	232
Luke	432	411
John	310	292
Acts	401	391
James	40	38
I Peter	40	38
II Peter	26	26 or 27
I John	52 or 53	51
II John	5	5

	<i>A</i>	<i>B</i>
III John	5	5
Jude	11	11
Romans	194	148
I Corinthians	132?	139
II Corinthians	99	95
Galatians	49	47
Ephesians	54	49
Philippians	35	33
Colossians	35	34
I Thessalonians	33	32
II Thessalonians	18	18

It will be seen that the type has almost disappeared except from the shorter writings. Codex A, then, is a document degenerate in type, but bearing traces of a distant genealogical relation to MSS of the pattern conserved by B.

3. If we take another instance, say Codex Augiensis, a bilingual codex collated by Scrivener, we have a tolerably even Greek text, containing 27 or 28 lines to the column, but the number of letters to the line fluctuates between wider limits than in previous cases. We may put—

	<i>Columns.</i>	<i>Lines.</i>
Romans	—	15
I Corinthians	50	27
II Corinthians	34	27
Galatians	17	15
Ephesians	18	9
Philippians	12	22
Colossians	13	6
I Thessalonians	11	17
II Thessalonians	5	25
I Timothy	13	18
II Timothy	10	2
Titus	6	6
Philemon	2	16

Here all trace of the ancient endings has disappeared, and the only thing noticeable in the endings is an accidental recurrence of multiples of 9.

E. 1. Leaving for a while the criticism of the New Testament, we now proceed to discuss and apply the general method of determining the forms of autographs of any series of letters.

If there were but a single size of letter-paper in use, and a single model to intimate the breadth and number of the lines which ought normally to be found upon each separate sheet, the following phenomena would present themselves in the study of any given collection of letters :

First, there would be a very great scarcity of letters ending at the first few lines of a page ; and secondly, as we move down the length of the page, we should find a greater number of letters ending at the successive places in the page. Let us call the number of epistles which occupy approximately any given space (the space itself being measured either by the lines of the paper or in any other way) the frequency for the space. Then we say that for letters occupying between n and $n+1$ standard pages, the frequency would be a maximum somewhere near the close of the $n+1$ th page, because there is a tendency, other things being equal, to end one's epistles rather at the bottom of a page than near the top.

For convenience, we shall now change slightly our method of statement ; we reserve the word *letter* for printed or written type, and use *epistle* for the document ; this will save confusion ; and we define as follows :

2. If x be the size of an epistle, expressed in lines of some standard length, or in actual letters, then the number of epistles in a given collection which occupy sizes between $x \pm \epsilon$ where ϵ is some small arbitrary quantity, is called the frequency for that size, and is denoted by $f(x)$. We construct the curve of frequency in the usual manner, and according to our reasoning it runs in the manner expressed by the small curve in the corner of the annexed plate. The meaning of this curve is simply this, that if any length ON be taken representing the length of a given epistle, then PN represents the frequency of epistles of that size.

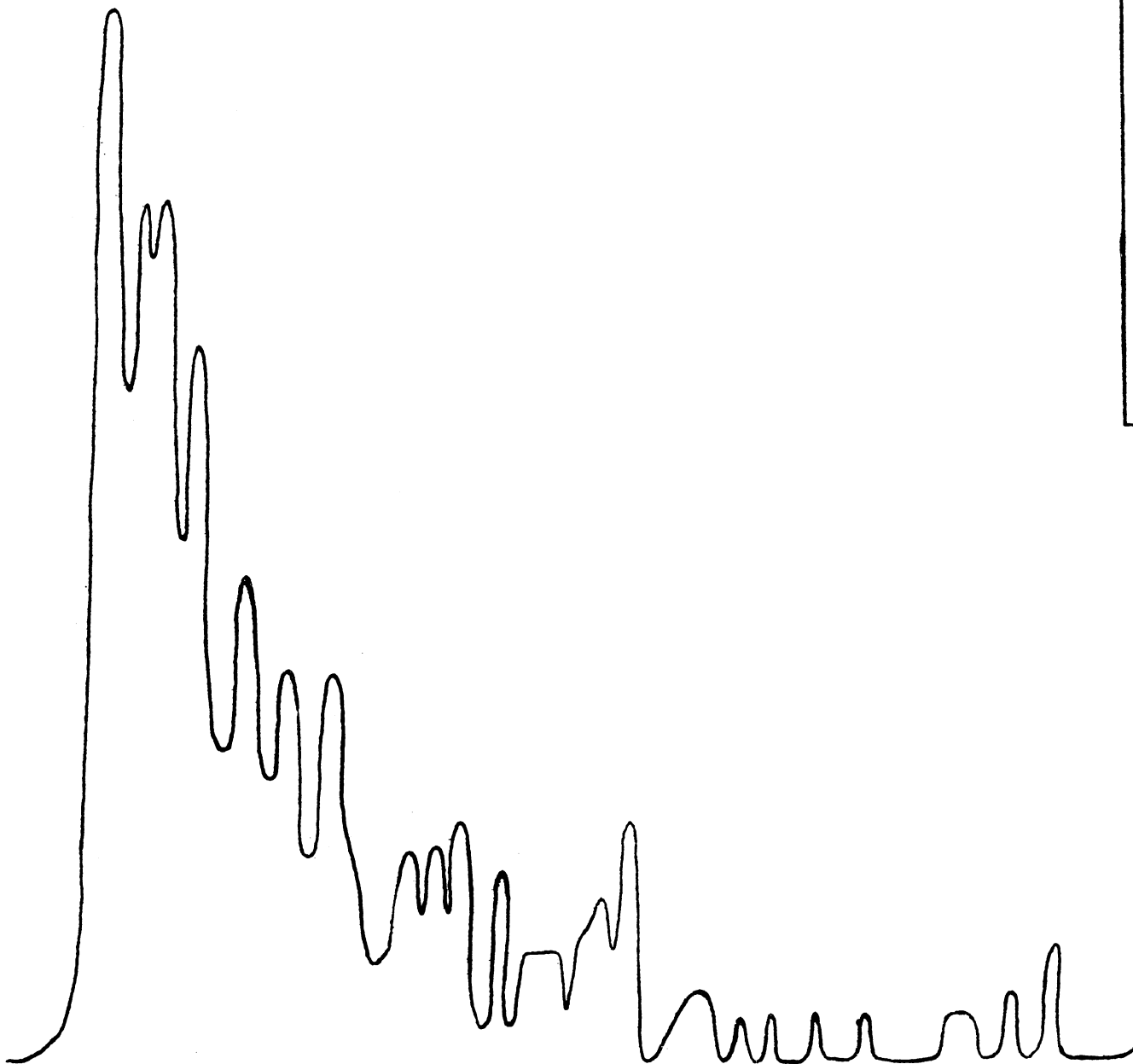
In our figure OA is a single page, OB two pages, and so on ; and the curve intimates that the frequency is a maximum just before we reach OA , OB , OC , etc., and that the frequency diminishes precipitately when we pass the points A , B , C , etc.

If now we assume a second size of paper and corresponding pattern, we should simply have to trace a second curve with its series of maxima over the first, and the complete system would represent the frequency. And the same would be the case if there were three, four or more patterns.

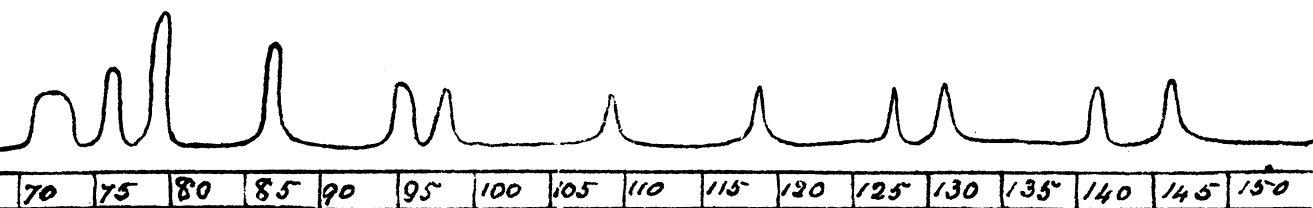
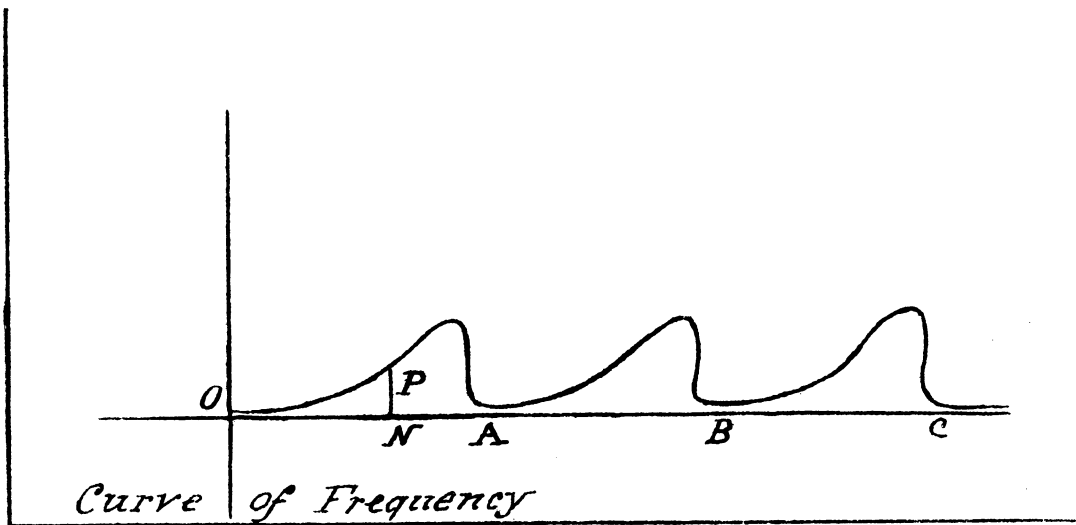
3. Conversely, if the curve were traced for us we ought to be able to determine very closely the normal sizes of the patterns of original writing. And it is to this problem that we address ourselves, since we have not a few collections of such ancient writings, and have strong evidence that the writers of those epistles used fixed models by which to write. Not to spend time in giving well-known quotations, we simply refer to Isidore, Orig. VI 12: "Quaedam genera librorum certis modulis conficiebantur; breviori forma carmina atque epistolae"; and observe with Birt, *Das Antike Buchwesen*, p. 288, and Reifferscheid, that the expression of Isidore is really taken from Suetonius. We will now commence to analyse the epistles of Pliny and to determine their modulus or pattern.

4. The table which follows will express the size of the different epistles as nearly as possible in terms of the number of lines which they occupy in the Teubner edition. Then from the complete tabulated results we will construct our curve, roughly to scale, and deduce the size of the normal Pliny epistle in terms of the Teubner line.

<i>No. of Teubner Lines.</i>	<i>Book I.</i>	<i>Book II.</i>	<i>Book III.</i>	<i>Book IV.</i>	<i>Book V.</i>	<i>Book VI.</i>	<i>Book VII.</i>	<i>Book VIII.</i>	<i>Book IX.</i>	<i>Book X.</i>	<i>Total.</i>
1											
2											
3											
4											
5					1		1		2	10	14
6	3	1			1	2		1	2	18	28
7					1	1	3	1	3	7	16
8			1	2			2	1	1	13	20
9				3		2	2	1	3	8	19
10		2		1		1	4	2	3	7	20
11			1	1		1	1	1	7	8	20
12	2			1	1	2		1		4	11
13	3	1		2	2	2	2			4	16
14	1			1		1	1	1	1	4	10
15						2		1	2	2	7
16			4	2		2	1			1	10
17						2	2		4		8
18	1	1					1	1	2		6
19	1			2	1	1	1	1			6
20		1		1		1			2	2	8
21				2		1		1			4
22	1			1		1	1			2	6



5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
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[illegible]

<i>No. of Teubner Lines.</i>	<i>Book I.</i>	<i>Book II.</i>	<i>Book III.</i>	<i>Book IV.</i>	<i>Book V.</i>	<i>Book VI.</i>	<i>Book VII.</i>	<i>Book VIII.</i>	<i>Book IX.</i>	<i>Book X.</i>	<i>Total.</i>
111											0
112											0
113											0
114											0
115											0
116											0
117											0
118									1		1
119											0
120											0
121											0
122											0
123											0
124											0
125											0
126											0
127											0
128		1									1
129											0
130											0
131								1			1
132											0
133											0
134											0
135											0
136											0
137											0
138											0
139											0
140											0
141					1						1
142											0
143											0
144											0
145											0
146			1								1

5. The curve is now approximately constructed, and is given in the annexed plate.

From the arrangement of the maxima in the curve of frequency we have now to deduce the normal form.

Our largest epistle is 146 lines of Teubner type; now we have Pliny's own statement that there are never more than twenty sheets

to a scapus or roll, and although this statement is not strictly accurate, we have a right to assume it to be so for Pliny himself. Suppose then that this 146 lines is just under 20 sheets, this would make the single sheets just over 7.3 lines; and we should expect to find successive maxima near the points $x = 7.3$, $x = 14.6$, $x = 21.9$, $x = 29.2$, and so on; or, beginning with the figures in reverse order, we look for maxima at the points 139.7, 132.4, 125.1, 117.8, 110.5, 103.2, 95.9, 88.6, 81.3, 74, 66.7, 59.4, 52.1, 44.8 and so on. This is found to be almost exactly the case for many of the places indicated. The higher maxima above $x = 50$ are at once seen to be parts of the same system; but the lower numbers of the system seem to be a little too small.

The single sheet estimated at 7.3 Teubner lines is a little wrong in its decimal place, and probably should be 7.5 or 7.6. For it is evident that the 20th page of the letter in question (III 9) was not quite filled. He says, "*Hic erit epistolae finis, re vera finis; litteram non addam.*" Taking the latter estimate, and observing that the average Teubner line may be put at 50 letters (which is very nearly the case), we have 380 letters to the Pliny page, which is just over 10 average hexameters; in all probability, then, the majority of the Pliny epistles, especially the longer ones, are written on a 20-lined page of half-hexameters. Whether in the smaller epistles a smaller pattern is sometimes used does not at present appear; but certainly almost all the long ones are very nearly of the pattern indicated.¹

6. We are able to apply our result to one interesting example.

In Pliny IV 11 we have an epistle of about 61 Teubner lines, in which the writer concludes by demanding an equally long reply, and threatens to count not only the pages of the answer, but the lines and syllables. "*Ego non paginas tantum sed versus etiam syllabasque numerabo.*" From the fact that the epistle is not quite 61 Teubner lines, and since $8 \times 7.6 = 60.8$, we infer that he actually finished the last sheet very closely. The allusion, then, to counting lines and syllables does not refer, as one might have at first supposed, to a superfluous page, but to his purpose not to be satisfied with an eight-paged epistle in reply unless the pages contain 20 good lines to the page, and each line of a proper length.

¹ For instance, if the normal page were 7.4 lines, there would not be more than about 3 out of the 20 longest epistles in which the concluding page was not more than half filled.

Birt (*Das Antike Buchwesen*, p. 161) has curiously underestimated the length of this epistle; he describes it as a long epistle, which must have occupied over *two* pages, and infers that the desired reply is to have at least *three* pages, the third of which is to carry ten additional lines, together with a half line of ten syllables.

It may be interesting to note that the celebrated letter of Pliny to Trajan (X 96) is written on a roll of seven sheets, wanting a couple of lines or thereabouts. The answer occupies about a sheet and a half of the same style of writing.

There are traces of the use of a smaller page of 20 half-iambics, or about 5.7 Teubner lines. Perhaps it is to this model and a roll of 5 sheets that Pliny refers, when he says (III 14), about the 22d line, "*Charta adhuc superest.*" The whole letter is not 30 lines. But it may almost as well be taken as a 4-paged letter of the larger size.

We can now print the Pliny letters from their autographs approximately.

7. It will be observed that the previous investigation enables us at once to fix a superior limit to the number of pages in the separate books to which the letters are reduced. A full page of the Teubner edition is 38 lines or 5 Pliny pages. The first book cannot therefore contain more than 105 Pliny pages. The second book gives precisely the same estimate, so does the third, and the fourth, and the fifth; the sixth gives 120 as the superior limit, the seventh 110, the eighth 105, the ninth 120, the tenth 150. *Could we have a more forcible suggestion that, in the majority of cases, the letters were actually reduced into rolls of 100 sheets apiece when they came to be edited?*

8. A precisely similar analysis applied to the Tauchnitz text of Josephus enables us to determine the original form of many of the documents embedded in his writings. We have extracted between 60 and 70 letters and decrees from the *Life* and the *Antiquities*.

The results arrange themselves as follows:

<i>Tauchnitz lines.</i>	<i>No. of Epistles of that length.</i>	<i>Tauchnitz lines.</i>	<i>No. of Epistles of that length.</i>
3	1	8	5
4	7	9	2
5	0	10	1
6	1	11	5
7	6	12	5

<i>Tauchnitz lines.</i>	<i>No. of Epistles of that length.</i>	<i>Tauchnitz lines.</i>	<i>No. of Epistles of that length.</i>
13	1	27	1
14	2	28	1
15	2	29	0
16	1	30	2
17	3	31	0
18	1	32	0
19	0	33	0
20	4	34	1
21	1	35	1
22	1	37	1
23	2	43	2
24	3	54	1
25	1	60	1
26	0		

Here we are at once struck with the recurrence of the multiples of four, and examination at once shows that four lines of Tauchnitz type in Josephus are 12 half-iambics or an S-page very exactly. Similar examination will show that a page of 20 half-iambics is 6.6 Tauchnitz lines, and a page of 20 half-hexameters is 11.6 lines. From these results the majority of the writings indicated are at once reduced to their original patterns. The recurrence of the S-type simply means that Josephus has manufactured not a few of them, as letters would have been written by his own hand, for we have already determined, from the stichometry of the Antiquities, and confirmed the result by the examination of certain letters, that Josephus uses the iambic verse as his model.

ERRATA.

- P. 3, lines 10 and 11 from bottom, read *passage* for "sentence."
P. 7, line 22 from top, read *is roughly represented by* for "is represented by."
P. 19, last line, read *Engastrimytho* for "Engastrimutho."
P. 22, line 21 from top, read *Saligniana* for "Saligniani."
P. 24, lines 16 and 15 from bottom, read *To this type belong the MSS formerly known as I, N, Γ (which are fragments of the same original)*;